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BIOMEDICAL AND BEHAVIORAL SCIENCES

No. 121

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9 October 1979

USSR REPORT
BIOMEDICAL AND BEHAVIORAL SCIENCES

No. 121

This serial publication contains articles, abstracts of articles and news items from USSR scientific and technical journals on the specific subjects reflected in the table of contents.

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USSR

UDC 631.527

THEORETICAL STUDIES OF WORLD PLANT RESOURCES FOR THEIR EFFECTIVE USE
IN PLANT SELECTION

Moscow SEL'SKOKHOZYAYSTVENNAYA BIOLOGIYA in Russian No 3, 1979 pp 275-284

BREZHNEV, D. D., All-Union Scientific Research Institute of Plant Growing,
imeni N. I. Vavilov, Leningrad

[Abstract] The accomplishments of the institute, originally called the All-Union Institute of Applied Botany and New Crops, and the contributions of Academician Vavilov to mutagenesis in plant selection are summarized. Research in the role of allopolyploidy, in eliminating plant infertility, and especially work with triticale is discussed. Other research topics presented include population theory, the effects of low temperatures, ultra-sound, and chemical and physical factors on mutagenesis. Vavilov's efforts in studying plant physiology, which are still continuing today, are outlined. An important dimension of the institute's work today is in the analysis of photosynthetic functions from evolutionary, ecological, geographic, and genetic aspects. Plant immunity and resistance to disease and weather extremes are further research subjects. References 17 (Russian).

USSR

UDC 581.056:502.757 + 631.527

MODERN PROBLEMS IN AGROMETEOROLOGY IN RESOLVING TASKS IN PLANT SELECTION
AND PLANT GROWINGMoscow SEL'SKOKHOZYAYSTVENNAYA BIOLOGIYA in Russian No 3, 1979 pp 297-305
manuscript received 20 Oct 78KOROVIN, A. I., All-Union Scientific Research Institute of Plant Growing,
imeni N. I. Vavilov, Leningrad

[Abstract] Efforts in the area of agrometeorology include attempted changes and regulation of the plant environment to enhance crop production, as well as selection of appropriate plant varieties to attain optimum utilization of various growing conditions in the Soviet Union. The Vavilov Institute, in seeking to improve the possibilities of studying such factors as time of germination and temperature tolerances, has developed phytotrons which reproduce various domestic growing conditions and contribute to the development of "passports" for plant varieties that show their applicability to Soviet growing conditions. Advantages and shortcomings of the phytotrons developed are discussed, with emphasis on temperature and drought resistance of grain crop hybrids. References 31: 28 Russian, 3 Western.

USSR

UDC 581.1.085:575.12 + 633

USE OF PLANT CELL TISSUE CULTURES IN AGRICULTURAL THEORY AND PRACTICE

Moscow SEL'SKOKHOZYAYSTVENNAYA BIOLOGIYA in Russian No 3, 1979 pp 306-315
manuscript received 14 Feb 79

BUTENKO, R. G., Institute of Plant Physiology imeni K. A. Timiryazev,
USSR Academy of Sciences, Moscow

[Abstract] In the study of cell differentiation leading to morphogenesis, phytohormones and synthetic compounds are often involved. A new direction in plant physiology is clone microreproduction of seed stock, which can reduce the time for producing economic quantities of hybrids from 8-15 years to 2-3 years. Cloning also contributes to avoiding diseases in seed stock, thus assuring high yields and quality. The discussion of transforming laboratory successes into practical implementation is divided into the topics of initial screening of physiologically-active compounds using cell cultures of higher plants, use of cultures to hasten and ease production of new strains, somatic cell hybridization, mutagenesis and cell selection, and practical tasks such as the development of clonal microreproduction of concrete crops, expansion of such production, and intensified research. Figures 5; references 35: 11 Russian, 24 Western.

USSR

UDC 631.599 + 581.1.032.3

DROUGHT RESISTANCE AND PRODUCTIVITY OF PLANTS

Moscow SEL'SKOKHOZYAYSTVENNAYA BIOLOGIYA in Russian No 3, 1979 pp 316-322
manuscript received 16 Feb 79

HENKEL, P. A., Institute of Plant Physiology imeni K. A. Timiryazev,
USSR Academy of Sciences, Moscow

[Abstract] The discussion is centered upon seeds or grains that have been tempered by a drying process that, in the author's thesis, adapts them to tolerate dry conditions so that they are able to withstand heat and drought conditions throughout the vegetation period. Such factors as fixing carbon 14, chromatin content and activity, endogenous inhibitors, and structural integrity were measured for control plants and tempered plants, with favorable success in these categories for the plants from the tempered seeds. The tempered plants had greater ductility and elasticity, higher protein content, and subsequently, higher yields. The varying effects of the tempering process for millet (the most effective), barley and wheat, and other grain crops, are discussed. Figures 3; references 28: 25 Russian, 3 Western.

USSR

UDC 631.53:633.11:633.14

BIOLOGICAL BASES OF TRITICALE AGROTECHNOLOGY AND SEED PRODUCTION

Moscow SEL'SKOKHOZYAYSTVENNAYA BIOLOGIYA in Russian No 3, 1979 pp 331-336
manuscript received 7 Jul 77

SHULYNDIN, A. F., The Ukrainian Scientific Research Institute of Plant Growing, Selection and Genetics, imeni V. Ya. Yur'yev, Khar'kov

[Abstract] The advantages of triticale, as a grain containing more protein than wheat or rye, for baking and confectionary use are discussed. While triticale withstands cold better, dry periods and lack of mineral fertilizers at the stages of gametogenesis and grain forming must be handled in order to raise optimum crops. Irrigation and application of fertilizers are discussed, and the correct time for planting is stressed as a factor for close regional study. Seed production of winter triticale is the subject of the study of varieties Ad 1 and Ad 206, which shows comparative yields of wheat and triticale. Potential diseases and the advantages of aging seed stock for a season are discussed, and the need for more productive varieties is suggested. Figure 1; references 12: 8 Russian, 4 Western.

USSR

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MODERN PROBLEMS AND PROSPECTS OF CORN PLANT SELECTION

Moscow SEL'SKOKHOZYAYSTVENNAYA BIOLOGIYA in Russian No 3, 1979 pp 337-344
manuscript received 15 Jan 79

SUSIDKO, P. I., DOMASHNEV, P. P. and DZYUBETSKIY, B. V., All-Union Scientific Research Institute of Corn, Dnepropetrovsk

[Abstract] Corn hybrids with short growing seasons that are resistant to cold were sought as a basis for developing self-pollinating lines and synthetic populations. The possibility of maturity of the grain during the days of longest sunshine is an important parameter discussed in relation to Soviet high-yield, early maturing strains. Other varieties are being developed that will thrive in arid conditions, and self-pollinating hybrids with two or more cobs per stalk are being sought. Irrigation, fertilization, and planting methods are summarized in describing attempts to reach yields of 100 centners/hectare. One approach has been the development of short-stemmed varieties. Domestic opaque hybrids with high lysine contents have been developed for specific areas of the Soviet Union. Silage types with improved nutritional qualities in the green mass and lower lignin content

have been developed on the basis of mutants bearing genes vt₁ and vt₂. Research is summarized that has been aimed at disease- and pest-resistant hybrids, as well as sturdy stems that facilitate mechanized harvesting. References 25: 23 Russian, 2 English.

UDC 631.82:631.587:633.15

EFFECT OF FERTILIZERS AND IRRIGATION ON THE DYNAMICS OF NUTRITIVE SUBSTANCES IN THE SOIL AND ON THE YIELD OF POSTHARVEST CORN

Moscow AGROKHIMIYA in Russian No 6, Jun 79 pp 76-82 manuscript received 27 Jun 78

F. N. ARKHIPENKO, Ukrainian Scientific Research Institute of Agriculture, Kiev Oblast'

[Abstract] During the 1973-1975 period, a study was carried out on the dynamics of nitrates, labile phosphorus compounds and metabolic potassium in relationship to the basic cultivation, fertilization and irrigation with the biologically purified effluent waters of Kiev. The nitrates, P_2O_5 and K_2O were determined at three depth levels: 0-20, 20-40 and 40-60 cm. Bukovinskiy 3 brand corn was planted in June, in warm, dry weather, therefore irrigation was required. It was established that basic soil cultivation improved the nitrification, and elevated the levels of P_2O_5 and K_2O , especially in the 0-20 cm layer, regardless of the method of application or depth of cultivation. Irrigation and general precipitation led to the washout of nitrates to the lower soil layers; P_2O_5 and K_2O were not affected. The yield of Bukovinskiy 3 corn was not related to the soil cultivation nor to the fertilization method. A synergistic effect was noted when irrigation was used with mineral fertilizers: the corn yield was improved, regardless of weather conditions. References 3 (Russian).

EFFECT OF THE CONTENT OF LABILE PHOSPHORUS IN THE SOIL ON WINTER WHEAT
YIELD AND ON THE EFFECTIVENESS OF PHOSPHORUS FERTILIZERS

Moscow AGROKHIMIYA in Russian No 6, Jun 79 pp 26-33 manuscript received
29 Jun 78

DERZHAVIN, L. M., POPOVA, R. N. and ZIMINA, L. M., TSINAO [expansion un-
known]

[Abstract] To determine possible relationship between the content of phosphorus in the soil, the yield of winter wheat and the effectiveness of phosphorus fertilizers, data from a decade of field studies by the agrochemical service has been analyzed. A direct relationship was found between the content of labile phosphorus in the soil and the yield of winter wheat in all climatic zones: tayga-forest, turf-podzolic and chernozem-forest-steppe zones. In the forest-steppe and steppe zones of the European USSR, the increase in grain yield per milligram of phosphorus in each kilogram of the soil was 3.9-4.6 kg of grain. This trend increased from east to west. The effectiveness of phosphorus fertilizers dropped with increased content of labile phosphorus: at the low level, the grain yield increased by 4.9-5.7 hundredweight per hectare upon addition of P_{60} ; at higher levels the increase was only 1.5-2.7 hundredweight per hectare. References 13 (Russian).

UDC 631.82:633.14

YIELD AND GRAIN QUALITY OF WINTER RYE AS A FUNCTION OF FERTILIZERS AND
PRECIPITATION

Moscow AGROKHIMIYA in Russian No 6, Jun 79 pp 67-71 manuscript received
27 Jun 78

LOMAKO, YE. I. and BELKOV, A. P., Kazan' Branch of TSINAO [derivation
unknown], Chuvash Republic Agrochemical Laboratory

[Abstract] The Chuvash agrochemical laboratory has carried out field studies in 1973-1976 on the relationship of the yield and albumin content of winter rye Vyatka 2 to nitrogen, phosphorus and potassium fertilizers and to meteorological conditions. No relationship was found between protein content and nitrogen and potassium levels. In general, nitrogen was responsible for 58.4 percent increase in the yield of the crop, phosphorus for 22 percent and potassium for 10.5 percent increase. The optimal dosage of the fertilizer for winter rye was $N_{90}P_{90}K_{60}$. A strong

correlation was found between the rye yield and the amount of precipitation during the vegetative period. References 13 (Russian).

UDC 633.811:631.526.32

RESPONSE FACTORS OF DIFFERENT VARIETIES OF PLANTS IN CONNECTION WITH THEIR INTERACTION WITH FERTILIZERS

Moscow AGROKHIMIYA in Russian No 6, Jun 79 pp 57-66 manuscript received 26 Jun 78

CHERNYSHEVA, N. F. and KLIMASHEVSKIY, E. L., Siberian Institute of the Chemization of Agriculture, Siberian Branch of the All-Union Academy of Agricultural Sciences, Novosibirsk; Forestry Institute, Siberian Branch of the USSR Academy of Sciences, Krasnoyarsk

[Abstract] A number of studies stressed the need for a differential approach to the selection of mineral fertilizers for specific grain cultures. It has been pointed out in the past that the high level of mineral fertilization could indicate the productivity potentials of individual plant species. This specificity, both agrochemical and physiological, of the response to nitrogen, phosphorus and potassium is dependent on the characteristics of functioning root system, on the photosynthetic capability and on the interaction between the genotype and fertilizer. The productivity of a species depends also on the rate of the flow of the assimilates from the leaves to the reproductive organs, especially in the hydrothermally unstable areas. The grain formation ability constitutes an additional factor. In spite of the fact that there are many more questions than answers, it should be possible to design rational systems of fertilization, adaptable to individual species as well as to develop new brands highly responsive to common fertilizers. References 22: 20 Russian, 2 Western.

PHYSICAL PROPERTIES OF NITROAMMOPHOSKA AND AMMOPHOS, AND THE QUALITY OF MIXED FERTILIZERS BASED ON AMMOPHOS

Moscow AGROKHIMIYA in Russian No 6, Jun 79 pp 51-56 manuscript received 23 Jun 78

MALONOSOV, N. L., Ramenskaya Agricultural Experimental Station, Scientific Research Institute of Fertilizers and Insectofungicides imeni Ya. V. Samoylov

[Abstract] Ammophos (AP) and nitroammophoska (NAP) are currently most popular among the complex fertilizers. Recent trend towards bulk storage and shipping of these agents makes it necessary to study their physical-chemical and mechanical properties. Long term bulk storage of AP and NAP was studied under various conditions. It was established that along with positive aspects such as granulometric consistency and reasonable durability, NAP is highly hygroscopic, subject to caking. In order to be able to store it, NAP must be dried down to 0.35 percent moisture content and cooled to 25-30° on storage. In contrast, ammophos from apatite is a non-hygroscopic material with low starting humidity, high static durability of the granules; it does not cake on storage, retaining its original granularity and durability, so that it can be stored for extended periods. Thanks to these properties and to the compatibility of AP with other fertilizers, it can be used as a base for the production of stable mixed fertilizers. Figures 2; references 8 (Russian).

EFFECT OF HERBICIDES ON THE CONTENT OF LABILE FORMS OF NUTRIENTS IN THE SOIL

Moscow AGROKHIMIYA in Russian No 6, Jun 79 pp 117-118 manuscript received 23 May 78

GAZIYEV, M. T., Azerbaijan Scientific Research Institute of Plant Protection, Kirovabad

[Abstract] The effect of dalapon, simazin, eradikan and glyphosat on the nutritional quality of the soil was investigated. The soil was fertilized with $N_{60}P_{60}K_{45}$ or with $N_{90}P_{90}K_{60}$. Simazin and eradikan were applied directly on the soil, dalapon and glyphosate were used to spray growing weeds. It was established that the use of herbicides had a positive effect

on the nutritional quality of the soil. The level of nitrogen and potassium was elevated at several depths under a variety of experimental conditions. The content of phosphorus in the soil varied randomly. No references.

UDC 631.811.94

ACCUMULATION OF NATURAL AND APPLIED COBALT AND ZINC BY PLANTS

Moscow AGROKHIMIYA in Russian No 6, Jun 79 pp 96-103

TIKHOMIROV, F. A., RERIKH, V. I. and ZYRIN, N. G., Moscow State University

[Abstract] The goal of this study was to establish the principal characteristics of the transfer of ^{60}Co and ^{65}Zn radioisotopes from soil into the plants. Experimental soils differed by their properties and composition. It was shown that acid soils contain the highest levels of metabolized Co and Zn; in two years no changes were noted in the content of natural Co and Zn compounds in the soil. The content of experimental radioisotopes remained constant for a long time in acid soils but diminished rapidly in neutral ones. Highest rate of Zn accumulation in the plants occurred in acid soils with relatively high content of the radionuclide introduced externally and low levels of natural zinc. Plants grown in neutral and carbonate soils showed lowest concentrations of ^{65}Zn ; behavior of ^{60}Co was analogous, its content in the plants being correlated with the natural Co level in the soil. It was concluded that the primary soil factor responsible for the transfer of ^{60}Co and ^{65}Zn into the plants is the pH of the soil, followed by the content of Ca and organic materials. Soils high in pH, and rich in Ca and organic carbon, complex the radionuclides forming insoluble compounds, making them unavailable to the plants. References 6 (Russian).

COMBINATIONAL CAPABILITIES OF WHEAT

Yerevan DOKLADY AKADEMII NAUK ARMYANSKOY SSR in Russian No 2, 1979 pp 113-118

SAAKYAN, G. A., Institute of Agriculture, Armenian SSR Ministry of Agriculture

[Abstract] Experimental data were reviewed for the combinational capabilities of several varieties of soft winter wheat which demonstrate that, on the basis of general and specific combinational capabilities, development of desired interstrain characteristics in F_1 hybrids does not depend on superdominant allelic genes, but on additive genes. The former cannot be reinforced in subsequent generations, while the latter can accumulate in a homozygotic genotype. Particularly high correlation coefficients (r) were found to apply between the height of plants ($r = 0.90$), tillering ($r = 0.95$), the weight of 1000 grains ($r = 0.75$) and the general combinational capability. References 14 (Russian).

USSR

UDC 547.963.32

NUCLEASE FROM ASPERGILLUS ORYZAE, SPECIFIC FOR SINGLE-STRANDED SECTIONS OF NUCLEIC ACIDS

Moscow BIOKHIMIYA in Russian Vol 44 No 6, Jun 79 manuscript received 7 Aug 78

ABRAMOV, R. YE., BEZIRDZHYAN, KH. O. and AKOPYAN, ZH. I., Institute of Experimental Biology, Armenian SSR Academy of Sciences, Yerevan

[Abstract] The source of the nuclease was amylorizin from the Rasskazovski Plant of Enzyme Preparations where it had been isolated from *Aspergillus oryzae* single strand, specific nuclease was prepared from the amylorizin by repeated chromatography. Some physico-chemical and catalytic properties of the enzyme produced were the same as those found in enzymes described in the literature but the enzyme differed in some major respects, especially in its capacity to split poly (A). The enzyme also hydrolyzed the synthetic dinucleotide pTpT within a 2-hour incubation at 45° resulting in formation of mononucleoside phosphate. Figures 5; references 20.

USSR

UDC 577.153.35

SUBSTRATE THERMOSTABILIZATION OF SOLUBLE AND IMMOBILIZED GLYCOAMYLASE

Moscow BIOKHIMIYA in Russian Vol 44 No 6, Jan 79 pp 1084-1092 manuscript received 18 Jan 78

KLESOV, A. A. and GERASIMAS, V. B., Chemistry Faculty, Moscow State University imeni M. V. Lomonosov

[Abstract] A kinetic method of study of enzyme thermal inactivation in the presence of a substrate producing a stabilizing or destabilizing effect was used to study inactivation kinetics of soluble and porous-silica-immobilized glucoamylase. The study indicated that the major role in the glucoamylase stabilization was played by the substrate stabilization (40-fold stabilization) rather than by the stabilization itself (3-fold stabilization). Binding of the substrate (maltose or maltodextrines) increased the thermal stability of glucoamylase with a 40-fold stabilization with respect to the soluble enzyme and only a 15-fold stabilization with respect to the immobilized glucoamylase. The degree of stabilization did not depend on the length of the substrate chain. The product of enzymic hydrolysis, glucose, produced a much lesser stabilizing effect. The overall effect of glucoamylase thermostabilization has practically the same limit (40-50-fold as compared to the soluble enzyme without the substrate) for both immobilized and soluble enzymes. Figures 2; references 24: 4 Russian, 20 Western.

SYNTHESIS OF L-ASPARTIC ACID FROM AMMONIUM FUMARATE BY MEANS OF FREE AND IMMOBILIZED CELLS OF ESCHERICHIA COLI

Moscow PRIKLADNAYA BIOKHIMIYA I MIKROBIOLOGIYA in Russian Vol 15 No 3, May/Jun 79 pp 328-336 manuscript received 20 Jun 78

YAKOVLEVA, V. I., MALOFEYeva, I. V., ZUYEVA, N. N., ANDREYEVA, A. P., GUBNITSKIY, L. S., SHERBAKOVA, V. N. and BEREZIN, I. V., Moscow State University

[Abstract] A method was developed for obtaining *Escherichia coli* 85 cells with high aspartase activity, immobilized by incorporation in polyacrylamide gel (PAG). The synthesis of L-aspartic acid from ammonium fumarate, using free and immobilized *E. coli* cells, was evaluated. The aspartase activity of immobilized cells could be increased substantially by heat pretreatment, so that the addition of toluene or autolysis was unnecessary. As a rule, the immobilized cells showed 1.5-2.5 times higher specific aspartase activity than the free cells; this was due to greater penetration of the cytoplasmic membrane during polymerization of PAG. Analysis of kinetic patterns of aspartate-ammonia lyase reaction catalyzed by free and immobilized *E. coli* 85 cells showed that the synthesis of L-aspartic acid has the following parameters: specific aspartase activity $4-6 \cdot 10^{-5}$ and $6-8 \cdot 10^{-5}$ mmole/mg·sec for free and immobilized cells respectively; cell content in PAG was 5-10 mg protein per gram of wet gel; pH optimum was 8.3-10.0. Figure 1; references 14: 8 Russian, 6 Western.

EFFECT OF THE DEGREE OF PURIFICATION OF PEPSIN ON ITS IMMOBILIZATION AND THE PROPERTIES OF IMMOBILIZED PREPARATIONS

Moscow PRIKLADNAYA BIOKHIMIYA I MIKROBIOLOGIYA in Russian Vol 15 No 3, May/Jun 79 pp 421-425 manuscript received 18 Jul 78

LUKOSHYAVICHENE, N. YU., ZHUKENE, V. V., SADAUSKAS, P. B. and KESTNER, A. I., Institute of Biochemistry, LitSSR Academy of Sciences, Vil'nyus

[Abstract] The goal of this study was to compare the immobilization of crystalline and technical pepsin on alkylamine silochrome, and to produce highly active, immobilized technical pepsin so that its properties could be studied. It was shown that the specific activity of the immobilized pepsin decreased with increasing amount of the enzyme bound on the surface

of the carrier. Glutaraldehyde immobilization of technical pepsin solutions on alkylamine silochrome led to selective binding of its components. The activity of immobilized technical pepsin was about 22 percent lower than the activity of the crystalline material. The results obtained showed that the immobilization process resulted in purification and activation of the enzyme, yielding a highly active, stable preparation. When suspended in 0.1 M citrate-phosphate buffer at pH 4.6 and 4°C, in presence of merthiolate, the activity of this preparation could be preserved for up to 6 months. Both the native and immobilized products have pH optimum of 1.8, just as the crystalline pepsin. Figures 5; references 6: 2 Russian, 4 Western.

USSR

EFFECT OF SHORT-TERM THERMAL STRESS ON GLYCOGEN AND TOTAL LIPID LEVELS IN THE LIVER AND SKELETAL MUSCLES OF THE RAT

Tashkent UZBEKSKIY BIOLOGICHESKIY ZHURNAL in Russian No 3, 1979 pp 38-40
manuscript received 19 Dec 78

AKHMEDOV, R. and KARIMOV, V. A., Institute of Physiology, Uzbek SSR Academy of Sciences

[Abstract] White rats of both sexes were used to determine the effect of thermal stress (35°C room temperature; rel. humidity 18-34%; 2 h per day for 3 days) on the levels of glycogen and total lipids in the skeletal muscles and liver, for comparison with the levels found in control rats (18-22°C room temperature; 68-72% relative humidity). Evaluation of the results for the adult, 180-220 g, rats showed that the form of thermal stress which was employed depressed liver glycogen from a mean value of 84 mg/100 g body weight in control animals to 56 mg/100 g in the experimental rats. The corresponding findings for muscle glycogen showed a decrease from 238 to 163 mg/100 g. However, while thermal stress induced a decrease in total lipid stores of the liver from 191 to 169 mg/100 g, the lipid content of the skeletal muscles increased from 1167 to 1446 mg/100 g of body weight. It appears that energy expenditures for the maintenance of temperature homeostasis came largely from the carbohydrate stores of the liver and the skeletal muscles. References 6: 5 Russian, 1 Western.

USSR

UDC 615.835.12.015.4:612.121.2

EFFECT OF HYPERBARIC OXYGENATION ON THE ACID-ALKALI STATE OF THE BLOOD

Moscow LABORATORNOYE DELO in Russian No 6, 1979 pp 325-328 manuscript received 17 Apr 78

FILIMONOVA, M. V., LUKICH, V. L. and BAZAROVA, V. S., All-Union Scientific Research Institute of Clinical and Experimental Surgery, USSR Ministry of Health, Hospital Surgical Clinic of the First Moscow Medical Institute imeni I. M. Sechenov

[Abstract] Shifts in the acid-base balance (ABB), blood gases and certain indices of external respiration were studied at the All-Union Hyperbaric Oxygenation Center on a group of 36 patients during treatment in single-place oxygen pressure chambers of the Oka-MT and Vickers type. Oxygen pressure was 1.7-2.0 absolute atmospheres, exposure time was 40-60 minutes, compression time 15 minutes and decompression time 10 minutes. Most of the subjects suffered from thrombic blocks in the extremities in the stage of subcompensation of peripheral circulation and trophic foot sores. The patients had no accompanying somatic illnesses or arterial hypoxemia. The ABB was studied by Asthrup's method, oxygen pressure in the blood was determined by Clark's electrode, and the degree of oxygen saturation of hemoglobin was measured on the OSM-1 oximeter made by the Radiometer Company in Denmark. Respiratory alkalosis was observed in arterialized capillary blood after a treatment session in the pressure chamber. The shifts took place against a background of elevation in the absorption of oxygen and an increase in the oxygen parameters of the blood. In the case of patients with initial hyperventilation and respiratory alkalosis, the session further increased total ventilation of the lungs and intensified respiratory alkalosis. The development of alkalosis in patients without arterial hypoxemia is attributed to adaptation to hyperbaric oxygenation. References 4: 1 Russian, 1 Czech, 2 Western.

USSR

UDC 616.22-006.6-08-05:612.616.31]-055.1

PARTICULARS OF SEX HORMONE EXCRETION IN MALE THROAT CANCER PATIENTS AS A FUNCTION OF THE EFFECT OF TREATMENT

Leningrad VOPROSY ONKOLOGII in Russian Vol 25 No 5, 1979 p 66

KISLYAKOVA, N. D., CHIZH, G. I., PICHKO, R. T. and LUNTOVSKAYA, V. A., Rostov Scientific Research Oncological Institute

[Abstract] Studies were done on sex hormone secretion in male throat cancer patients as dependent on age and treatment results. Tests were

done before and after radiation therapy and combined treatment (including radiation therapy and surgery). It was found that regardless of age, type of treatment or effectiveness, the level of testosterone excretion was reduced in all throat cancer patients as compared with the level of the hormone in the urine before treatment and in healthy patients. This is attributed to the inhibiting effect of x-rays on the male gonads. Successful treatment was characterized by some tendency to retain a sufficient level of androgens (androsterone or total 17-ketosteroids), as well as a certain ratio of inactive and active estrogens. Thus the success of radiation treatment depends on finding ways to protect steroid homeostasis. References 3 (Russian).

USSR

UDC 618.14-006.6-06:616.453

IMPAIRED REGULATION OF ADRENAL FUNCTION IN PATIENTS WITH CANCER OF THE CORPUS UTERI

Leningrad VOPROSY ONKOLOGII in Russian Vol 25 No 5, 1979 pp 62-63

OSTROUMOVA, M. N., KRYLOVA, N. V. and VISHNEVSKIY, A. S., endocrinology laboratory, "Order of the Red Banner of Labor" Scientific Research Institute of Oncology imeni Professor N. N. Petrov, USSR Ministry of Health

[Abstract] An investigation is made of the functional state of the hypothalamus-pituitary-adrenal system in patients with uterine cancer based on the dexamethasone test used in diagnosing Cushing's syndrome. The test results were compared with metabolic indices functionally related to the action of glucocorticoids. The results showed that this test can reveal latent defects in adrenal function regulation that are conducive to impairment of carbohydrate and fat metabolism. References 12: 5 Russian, 7 Western.

AGE PECULIARITIES OF ESTROGEN EXCRETION IN BREAST CANCER PATIENTS

Leningrad VOPROSY ONKOLOGII in Russian Vol 25 No 5, 1979 pp 56-57

MEZINOVA, N. N., professor, chief of the endocrinology laboratory with breast pathology group, BOGDANOVA, A. G. and TOGAYBAYEVA, Z. I., Kazakh Scientific Research Institute of Oncology and Radiology

[Abstract] An investigation is made of differences in estrogen excretion in premenopausal and postmenopausal breast cancer patients. Before menopause, breast cancer has little effect on estrogen excretion. After menopause, the excretion of estrogens frequently increases in patients with breast cancer as compared with healthy women. At onset of menopause, healthy women showed a reduction in estrogen excretion to half the level before menopause, with a further reduction to one-third the premenopausal level after ten years. In breast cancer patients, the estrogen excretion is higher than the level in healthy women at menopause, increases slightly for five years, then decreases slightly so that at ten years after menopause the estrogen excretion is nearly down to the level observed in these patients at menopause. References 9: 4 Russian, 5 Western.

USING A TRANSFECTION METHOD TO SEARCH FOR VIROGENETIC INFORMATION IN HUMAN TUMOR DNA

Leningrad VOPROSY ONKOLOGII in Russian Vol 25 No 5, 1979 pp 50-55

KNYAZEV, P. G., PEREVOZCHIKOV, A. P., KOROBITSYN, L. P., ZHUDINA, A. I., KUZNETSOV, O. K., SAVOST'YANOV, G. A., DYAD'KOVA, A. M. and SEYTS, I. F., professor, director of the biochemistry laboratory of the "Order of the Red Banner of Labor" Scientific Research Institute of Oncology imeni Professor N. N. Petrov, USSR Ministry of Health

[Abstract] Studies were done on cancerous DNA from blood cells containing 93% hemocytoblasts taken from an adult patient with acute myelogenous leukemia, and from polymorphocellular rhabdomyosarcoma, synovial sarcoma and neurinoma tissue removed during surgery. The recipients were cultures of human embryo cells that did not produce spontaneous oncornavirus particles. The cultures treated with the DNA from the leukemic blood cells produced virus-like RNA-containing particles as shown by data of radioisotopic analysis, and by the content of reverse transcriptase in

these particles. Tests of the biological activity of the DNA from human rhabdomyosarcoma, synovial sarcoma and neurinoma cells showed that treatment with this DNA did not induce production of oncornavirus particles although the recipients showed acceleration of cell growth. Figures 2; references 11: 3 Russian, 8 Western.

USSR

UDC 543.42:547.963:578.085.21

QUANTITATIVE EVALUATION OF PATHOMORPHOLOGICAL REACTIONS OF INITIALLY TRYPSINIZED KIDNEY CELLS OF THE GUINEA PIG EMBRYO SUBJECTED TO A WEAKLY-ONCOGENIC ADENOVIRUS 7 SEROTYPE

Alma-Ata IZVESTIYA AKADEMII NAUK KAZAKHSKOY SSR, SERIYA BIOLOGICHESKAYA
in Russian No 3, May/Jun 79 pp 45-49

GOLUBCHIKOV, V. S., Institute of Microbiology and Virology, KazSSR Academy of Sciences, Alma-Ata

[Abstract] Using absorptive photoelectric cytometry in the visible and ultraviolet region it was established that the synthesis dynamics of nucleic acids and proteins by trypsinized kidney cells of the guinea pig embryo changes during the first 42 hr. During this time, the cells inoculated with the adenovirus 7 serotype undergo many morphological transformations. At first the cells intensively synthesize the protein and nucleic acids and their nucleoli increase in size. A partial integration of the genomes of adenovirus and cells suppresses somewhat the genetic apparatus of the cell-host, and this changes the fundamental periodicity inherent in the dynamic organization of each cell. Disturbances in the homeostasis of cells infected with the virus led to changes in the synthesis of nucleic acids, followed by a slowdown in the synthesis of proteins. The first morphological reaction of cells to viral infection is a change in the transport dynamics of the synthesized substances. Figures 2; references 7: 5 Russian, 2 Western.

VASCULAR PERMEABILITY, BLOODFILLING INTENSITY AND SORPTION CAPACITY OF
TISSUES AFTER ACUTE BLOOD LOSSES AND INTRAVENOUS ADMINISTRATION OF
PLASMA SUBSTITUTE SOLUTIONS

Kiev FIZIOLOGICHESKIY ZHURNAL in Russian Vol 25 No 1, Jan/Feb 79 pp 41-46
manuscript received 30 Aug 77

FEDOROVA, Z. P., GITIS, YE. I., FEDOROV, V. I. and SHMYREVA, T. I.,
Laboratory of Pathophysiology, Kiev Institute of Hematology and Blood
Transfusion

[Abstract] Influence of the plasma substitute solutions (polyglukin, gelatinol, sodium lactate solution, albumin, physiological solution) on bloodfilling of heart, liver, lungs, kidneys and spleen tissues, sorption capacity of these tissues, capillary bloodflowing intensity and exchange of tissue fluid and blood plasma proteins between the blood and internal tissues were studied. Experiments were carried out with dogs and rabbits, with a blood loss up to 60% for dogs and up to 50% for rabbits. The intravenous administration of the substitute solutions amounted to volume of the blood loss. A loss of vascular fluid and proteins from blood vessels and into surrounding tissues increased to 113 and 108%, respectively, 10-15 min. after a massive blood loss. These losses of fluid and proteins from the blood decreased after the volume of the lost blood was compensated by an equal volume of the substitution solutions. At this point the motion of the fluid changed into opposite direction (from tissues into blood vessels). However, in those cases when losses of blood amounted to 80% of the total blood volume, the permeability vector remained in the same direction, namely, blood \rightarrow tissues, after injection of the polyglukin and gelatinol. The bloodfilling of tissues of heart, kidney, spleen and lungs amounted to 58, 59, 69 and 26%, respectively, of the normal level after a massive blood loss, without the use of substitute solutions. Infusion of polyglukin, gelatinol and 6% albumin solution decreased still further the bloodfilling of all internal organs. An especially sharp decrease in the capillary blood flow was observed in kidneys after an acute blood loss and after the infusion of substitute solutions (from -20 to -57%). Sorption capacity of all tissues under study was also low after a massive blood loss. The sorption capacity of tissues of heart, lungs and kidneys decreased by 58, 53 and 74%, respectively, in comparison with the initial level, after infusion of polyglukin, gelatinol and albumin solutions. The sorption capacity of heart, lungs, kidneys, liver and spleen decreased by much lower values after infusion of the sodium lactate solution and physiological solution. The sorption capacity of kidneys suffered most, regardless of the substitution solutions used in experiments. Figures 1; references 12 (Russian).

USSR

UDC 547.963.32

CHROMATIN BIOGENESIS IN CELLS OF HIGHER ANIMALS. ACTIVATION OF SYNTHESIS OF NUCLEAR PROTEINS AND DNA OF HEPATOCYTES AFTER PULSED INHIBITION OF TRANSLATION BY CYCLOHEXIMIDE

Moscow BIOKHIMIYA in Russian Vol 44 No 6, Jun 79 pp 963-974 manuscript received 2 Oct 78

BOYKOV, P. YA., SIDORENKO, L. I. and TODOROV, I. N., Division of the Institute of Chemical Physics, USSR Academy of Sciences, Chernogolovka, Moscow Oblast

[Abstract] Administration, to fasting (24 hours) white mongrel rats (120-150g), of a single intraperitoneal dose (0.2 - 0.4 mg/100 g body weight) of cycloheximide in 0.14 M NaCl was followed by stimulation of synthesis of nonhistone proteins, histones and DNA of nuclear chromatin in the rat liver cells. Three stages of subsequent changes of protein synthesis included a stage of inhibition (0-6 hours) after cycloheximide injection accompanied by rapid cessation of protein neogenesis (for 15-30 minutes), a stage of restoration (6-12 hours) with continuous increase of rate of incorporation of radioactive aminoacids in the protein up to control levels and a stage of activation of replicative DNA synthesis (12-24 hours) with specific radioactivity of proteins exceeding control levels 1.5 - 2 times. Two peaks of stimulation of histone synthesis were noted, one during which DNA replication was suppressed (24 hours) and one coupled with DNA replication (48-60 hours). Thus, there occurred synthesis of histone protein coupled with and not coupled with DNA synthesis. Intense acetylation of histones of nuclear chromatin occurred at the stage of restoration and stimulation of protein synthesis. Possible use of this model in study of chromatin biosynthesis was discussed. Figures 9; references 40: 7 Russian, 33 Western.

USSR

UDC 631.465

IMMOBILIZATION OF ENZYMES BY SOIL

Yerevan DOKLADY AKADEMII NAUK ARMYANSKOY SSR in Russian Vol 68 No 2, 1979 pp 109-112

BAGRANYAN, A. N., ABRAMYAN, S. A. and GALSTYAN, A. SH., Institute of Soil Science and Agrochemistry, Armenian SSR Ministry of Agriculture

[Abstract] Determinations on a number of enzymes in alkaline saline soils demonstrated that soil-enzyme binding was covalent and attributable

to clay and humus substances. Crops and attendant microbial flora are largely responsible for the presence of enzymes in the soil; the enzymes can serve as labels in following the evolution of a soil from the hydromorphic alkaline saline soil stage to zonal meadow-type brown soil. Figure 1; references 9: 8 Russian, 1 Western.

USSR

UDC 615.471:576.077.5

METHOD OF BACTERIOPHAGE REPLICATION USING THE TAKACHI APPARATUS

Moscow LABORATORNOYE DELO in Russian No 6, 1979 pp 366-368 manuscript received 31 Mar 77

FOMENKO, G. A., Department of Microbiology of the Sanitation Hygiene Faculty, Group of Infectious and Noninfectious Immunology, Rostov Medical Institute

[Abstract] A technique is outlined for using the Takachi serological reaction device for phage replication. The diluting rods with capacity of 0.025 ml are fastened to the stand of the device with improvised rubber clamps. Test tubes are filled with working cultures of bacteriophage and held in the proposed stand. The diluting rods are then lowered as a block into the test tubes, after which they are placed in contact with the nutrient medium. As the level of the bacteriophage drops, the rods are lowered manually. The spots on the agar will be comparable in size and volume. The improvised clamp allows enough freedom for adjusting the rods to give the proper sized spots. The proposed method of using the Takachi microtitrator may also be applicable to other fundamentally similar model experiments involving transfer of small volumes of various liquids. Figures 2; references 2 (Russian).

USSR

UDC 612.17:591.412

SYNCHRONIZING INTERACTION AND MECHANISM OF GENERAL RHYTHM FORMATION OF
A HEART PACEMAKER. II. NATURE AND MECHANISM OF SYNCHRONIZING INTERACTION
BETWEEN AUTOMATIC STRUCTURES OF THE HEART

Moscow BIOLOGICHESKIYE NAUKI in Russian No 6, 1979 pp 46-49 manuscript
received 8 Feb 78

KAUSER SAYD ABU EL' ELA, UDEL'NOV, M. G. and SUKHOVA, G. S.

[Abstract] Experimental results are presented of bioelectric interactions between rhythmically active preparations, when the presence of other factors (mechanical or humoral) are excluded. At the same time, some information is given on the extent of rhythmic changes of a whole pacemaker region preparation when this region is fragmented, as well as on the role played by excitation in the formation of the pacemaker rhythm. Three types of experiments were carried out, with the use of filter paper wetted in Ringer solution, aluminum foil and polyethylene film. When two preparations with 46 and 26 beats/min. with filtering paper between them were imposed on each other, the resulting synchronized rhythm amounted to 35 beats/min. Upon their separation, the rhythm of the high-beat preparation returned to its initial number of beats and the low-beat preparation almost reached its initial number of beats. The extent of rhythm changes in the first and second case amounted to 6 and 14%, respectively. When aluminum foil was used between preparations with 36 and 9 beats/min., the general rhythm was established in two cycles and it amounted to 42 beats/min. After their separation, the number of beats of the first preparation was back to normal, while the second was 10 beats/min. Their rhythmic changes amounted to 5% for high-beat and to 19% for low-beat preparations. The 0.03 mm polyethylene film did not produce any synchronization of two preparations. These results point out that rhythm of two mutually-interacting preparations undergo synchronization when mechanical and chemical interactions are excluded between them. Synchronization was observed in all cases when electric interactions between preparations were present. It can be assumed that these interactions take place on account of superimposed electric fields which originate in the course of rhythmic motions of the potentials. Figures 2; references 4: 2 Russian, 2 Western.

USSR

UDC 632.792

**PRACTICAL PROBLEMS IN THE USE OF SCLERODERMA FAMILY ENTOMOPHAGES
(HYMENOPTERA, BETHYLIDAE) - NATURAL ANTAGONISTS OF TREE TRUNK PESTS**

Ashkhabad IZVESTIYA AKADEMII NAUK TURKMENSKOY SSR, SERIYA BIOLOGICHESKIKH
NAUK in Russian No 3, 1979 pp 76-79 manuscript received 20 Jan 79

MAMAYEV, B. M. and YAGDYEV, A., Institute of Zoology, Turkmen SSR Academy
of Sciences

[Abstract] Considerable interest was recently generated in the Turkmen
ant (*Scleroderma Turkmenica* Mam. et Krav.), as a biological agent in
systemic control of tree trunk pests which destroy wood pulp. The insect
pests are not reached by chemical agents because they live inside the
trees or tree products. Therefore, introduction of a wide spectrum ento-
mophage would be very desirable. However, there are still some problems
to be solved, among them development of an inexpensive way to mass produce
these ants. This paper reviews the available data such as general biological
description, methods of reproduction and preservation of entomophages. The
methods of reproduction, accumulation and storage still need to be worked
out, but there is no doubt that this entomophage will be very effective in
controlling tree trunk pests. References 5: 3 Russian, 2 Western.

USSR

UDC 576.851.42.095.383.083.1

TECHNIQUE FOR ISOLATING BRUCELLA FROM FIELD RODENTS

Moscow LABORATORNOYE DELO in Russian No 6, 1979 pp 380-381 manuscript received 16 Apr 77

DUSHINA, O. P. and SAVCHENKO, N. T., Chechen'-Ingush Republic Sanitary Epidemiological Station

[Abstract] The report describes a technique for isolating brucellae from wild mouse-like rodents in studying field materials for tularemia. The spleens of the rodents are taken for inoculation of white mice with group and individual suspensions. If no tularemia microbes show up in the white mice after two weeks, they are sacrificed, and inoculations are prepared from the spleen and para-aortal lymphatic nodes, which are placed on a coagulated yolk medium or agar. Growth of brucellae was observed within 2-3 days after inoculation. The proposed method can be used for parallel brucella and tularemia studies without loss of time and materials.

USSR

UDC 599.742.4

FLUCTUATIONS IN THE SOUTHERN LIMIT OF THE RANGE OF PUTORIUS EVERSMANNI
IN WESTERN TURKMENIA

Moscow BYULLETEN' MOSKOVSKOGO OBSHCHESTVA ISPYTATELEY PRIRODY, OTD. BIOL.,
in Russian Vol 84 No 3, May/Jun 79 pp 46-48 manuscript received 3 Aug 77

CHELNOKOV, V. N., ZUYCHENKO and FEDYASHEV, A. YU.

[Abstract] The range of *Putorius evermanni*, the steppe polecat, with respect to its borders, is not adequately defined. Although it is assumed to be found everywhere in Central Asia, this is apparently not the case. It is found on the shores of the Caspian down to Krasnovodsk and further south. This present report used data of reports and massive trappings by the plague control service. The polecat did not appear on the Krasnovodsk peninsula or the Bol'shoy Balkhan piedmont from 1953-1971, an absence attributed to fluctuations in numbers of susliks and gerbils. When these are decimated by epizootics in Western Turkmenia, the polecat range shifts northward for several years. Figures 3; references 6 (Russian).

USSR

UDC 616.988.75-07:[616.316+617.749]-097.5-078.734

MICROMETHOD OF ORGANIZING A PASSIVE HEMAGGLUTINATION REACTION AS A TEST FOR A2 INFLUENZA VIRUS ANTIBODIES IN LACRIMAL FLUID AND HUMOR OF THE ANTERIOR CHAMBER OF THE EYE

Moscow LABORATORNOYE DELO in Russian No 6, 1979 pp 338-340 manuscript received 1 Feb 77

VINOGRADOVA, V. L. and BASOVA, N. N., Moscow Scientific Research Institute of Eye Diseases imeni Helmholtz; Central Scientific Research Institute of Epidemiology, USSR Ministry of Health

[Abstract] The authors have developed a modification of the passive hemagglutination immune reaction with formalinized erythrocytes to test for A2 influenza antibodies in the lacrimal fluid and humor of the anterior chamber of the eye. A brief description is given of the procedure used in preparing the antigen, sensitizing the erythrocytes with the virus, collecting the study material and setting up the immune reaction. Use of the proposed reaction to detect flu antibodies in the lacrimal fluid of a diseased eye in combination with an immunofluorescent method of detecting antibodies in the conjunctiva will enable diagnosis of eye diseases in flu etiology. The method has the advantages of sensitivity and the capability for using a small volume of material, which is of particular importance in ophthalmology. References 10: 8 Russian, 2 Western.

USSR

UDC 576.858.75.097.2

ANTIGENS TO HEMAGGLUTININS OF INFLUENZA VIRUSES ISOLATED FROM HUMANS AND BIRDS

Moscow VOPROSY VIRUSOLOGII in Russian No 3, 1979 pp 242-247 manuscript received 15 May 78

KOSYAKOV, P. N., PANKRATOV, V. S. and ROVNOVA, Z. I., Institute of Virology imeni D. I. Ivanovskiy, USSR Academy of Medical Sciences, Moscow

[Abstract] Immunological analysis (complement fixation test) of influenza viruses A/Hong Kong/1/68, A/Port Chalmers/1/73, A/Chicken/USSR/315/70, A/Chicken/Kamchatka/12/71 and A/Tern/Turkmen/18/73 cultivated on chick embryo allantois revealed that the hemagglutinins of the two avian viruses (A/Chicken/12/71 and A/Tern/18/73) had three antigenic determinants. One (H3) is common to all human and avian viruses; the second is typical for

the hemagglutinins of A/Hong Kong/1/68 and the avian viruses; and the third is specific for the avian viruses but is different for the chicken and tern virus strains. The hemagglutination inhibition test with inhibitor-free serum produced results on viral antigenic composition similar to those in the literature and with monoreceptor anti-H3 serum data indicating the presence of the H3 antigen determinant on the avian viruses. References 12: 11 Russian, 1 Western.

USSR

UDC 618.19-006.6-078:576.858.6.097.2

SEARCH FOR A NEW ONCORNAVIRUS D-ASSOCIATED ANTIGEN IN HUMAN MALIGNANT BREAST TUMORS

Moscow VOPROSY VIRUSOLOGII in Russian No 3, 1979 pp 247-251 manuscript received 3 Mar 78

KOSYAKOV, P. N., KOROSTELEVA, V. S., PAVLYUCHENKOVA, R. P., KOSYAKOVA, N. P., NABOKOV, YU. S., MOGILEVSKIY, I. L. and KULAKOVA, A. M., Institute of Virology imeni D. I. Ivanovskiy, USSR Academy of Medical Sciences; First Moscow Medical Institute imeni I. M. Sechenov, Moscow

[Abstract] Sera to a new nonvirion antigen were specific with high titers (1:1280-1:2560) in the malignant human cell tissue cultures HEp-2 and I-96, which produce oncornavirus D spontaneously, and also in the mouse L cell culture infected with this virus. The new antigen associated with oncornavirus D was isolated from 9 (16.7%) of 54 women with malignant breast tumors but not from cancer-free areas of the breasts. Antigen titers in malignant tumor tissue varied from 1:80 -1:160. The failure to isolate the new antigen in the remaining breast cancer patients may be related to the low sensitivity of immunological and biochemical methods used. The new antigen was not isolated from 17 patients with breast fibroadenomas and mastopathies. The new virus-associated antigen was identical to the tissue culture antigen serologically and in its physical and chemical properties. It differed from it in its relative heat resistance and sensitivity to ether treatment. Inconsistent literature data on virus-associated activity in breast cancer tissue is briefly discussed. References 13: 10 Russian, 3 Western.

USSR UDC 616.988.23-085.371:576.858.23]-053.2-092:612.017.1+615.371:
576.858.23].015.46

FORMATION OF IMMUNITY TO THE POLIOMYELITIS VIRUS IN INFANTS WITH THE USE
OF DIFFERENT METHODS FOR ADMINISTERING THE LIVE POLIOMYELITIS VACCINE

Moscow VOPROSY VIRUSOLOGII in Russian No 3, 1979 pp 252-259 manuscript
received 20 Mar 78

DROZDOV, S. G., ZAEVANDROVA, V. I., SMIRNOVA, G. A., SHMEL'KOV, YU. A.
and KODKIND, G. KH., Institute of Poliomyelitis and Viral Encephalitis,
USSR Academy of Medical Sciences, Moscow; Dmitrovskaya Municipal Sanitary
Epidemiological Station, Moscow Oblast

[Abstract] A total of 34 healthy 2-4 month-old infants were vaccinated
perorally four times with drops of a live trivalent vaccine (Sabin strain)
(group A) or three times with the vaccine in gelatin capsules and a fourth
time with the drops (group B). The vaccine dose contained 1-1.5 million
PFU [plaque forming units] type I, 100-250 thousand PFU type II and 140-
300 thousand type III. Manifest resistance to the polio virus was obtained
in 93-100% of the children with the use of the methods indicated. Adap-
tation to type I was observed in all children after the first vaccination
and seroconversion in more than 60%. The suppression of the multiplication
of type I by type II virus was more pronounced in those vaccinated with
the capsules than in those vaccinated with the drops. After the second
and third vaccinations, the suppressing effect of type III on type I was
noted in group B children and, regardless of the 94-100% seroconversion,
37% did not exhibit local (alimentary tract) resistance to type I virus
after the three vaccinations. Peroral administration of the liquid vaccine
ensured contact of the vaccine virus with oropharyngeal tissue and facil-
itated the more rapid and complete immunity formation to the type I virus.
Type III was the weakest immunogenic component in group A children; after
the second vaccination, antibodies to type III were found in 93% of group
A children in titers considerably higher than in group B. The data
obtained indicate that factors other than interaction of vaccine strains
in the intestines affect immunity formation and that pharyngeal lymphoid
tissue (tonsils) have a significant role in this. The 6-week interval
between vaccinations was sufficient for immunity formation but not long
enough for the development of pathogenic viral variants. Detailed infor-
mation is given on the frequency and the duration of the release of the
virus strains for each vaccination period. Figures 3; references 26:
6 Russian, 20 Western.

INTERACTION BETWEEN CELLS AND VENEZUELAN EQUINE ENCEPHALOMYELITIS VIRUS ts-MUTANTS

Moscow VOPROSY VIRUSOLOGII in Russian No 3, 1979 pp 271-277 manuscript received 11 Feb 78

TSILINSKIY, YA. YA., KARPOVA, YE. F., PRYANICHNIKOVA, L. V., KOPTYAYEVA, I. B., SURKOV, V. V., SVESHNIKOVA, N. A. and TIKHONENKO, T. I., Institute of Virology imeni D. I. Ivanovskiy, USSR Academy of Medical Sciences, Moscow

[Abstract] The interaction between HeLa cells and attenuated strains of the Venezuelan equine encephalomyelitis (VEE) virus ts-mutants at a non-permissive temperature (39°C) was characterized by a stage of acute infection, a latent period and a repopulation stage. HeLa cells in the repopulation stage could be divided into three types. Type 1 cultures produced the infectious virus, but exhibited no cytopathic effect; cell DNA was not infectious. Type 2 cultures were chronic virus carriers. The infectious virus could not be isolated by conventional methods nor by a mixed culture method. Cultivation at permissive temperatures did not induce the virus; negative results were also obtained with the fluorescent antibody technique. DNA extracted from cells produced positive results in complementation tests, had a cytopathic effect on chick fibroblast and BHK-21 [baby hamster kidney] cultures, and formed plaques on green monkey kidney cells. During DNA titration, 1 TCA₅₀ [titer of cytopathic action] contained 1 µg DNA and 0.6 µg of DNA corresponded to 1 plaque forming unit. The DNA lost its infectivity after treatment with DNase, but not RNase or VEE antiserum. The virus obtained after transfection was serologically and biologically identical to the VEE virus. The viral genome was lost after 10 passages. Type 3 cultures did not contain the infectious virus or the viral genome as indicated by complementation, molecular hybridization or cell DNA infectivity tests. The existence of provirus DNA in the infected cells is postulated. Figures 1; references 12: 3 Russian, 9 Western.

MODELING OF VIRAL CHEMICAL CARCINOGENESIS IN MICE CHRONICALLY INFECTED WITH HERPES SIMPLEX TYPE 2

Moscow VOPROSY VIROSOLOGII in Russian No 3, 1979 pp 277-282 manuscript received 18 Mar 78

KITSAK, V. YA., MOYSIADI, S. A. and BOCHAROV, A. F., Central Institute for the Advanced Training of Physicians, USSR Ministry of Health, Moscow

[Abstract] Mice treated with 20-methylcholanthrene (20-MCA) and the herpes simplex virus type 2 (HSV-2) separately or in combination were divided into two groups by weight (group A: 25-30 g; group B: 10-12 g). Group B animals were more sensitive to HSV-2, whereas group A animals were more sensitive to the blastomogenic effect of 20-MCA. Administration of 20-MCA increased sensitivity to the lethal effect of the virus during the first 25 days of exposure by 3.5-fold in group A mice and 1.8-fold in group B mice. This difference became insignificant toward Day 74 of the experiment. Treatment of mice with 20-MCA or 20-MCA plus HSV-2 induced solid tumors in the inguinal region by Day 74-81 with the maximum number of tumors noted from Day 94-122. HSV-2 had a cocarcinogenic effect which was indicated by the intensification of the 20-MCA blastomogenic effect in HSV-2 infected mice. The synergic effect observed may be related to the intensification of the carcinogenic effect of 20-MCA due to the virus' immunodepressive or other effect or to the manifestation of the HSV-2's carcinogenic effect during treatment of cells with 20-MCA. Neoplasias were confirmed by subcutaneous transplantation of tumor sections in mice for three months. Cell cultures obtained from mouse tumor tissue remained viable for 4-6 weeks; some cultures with epithelium-like polygonal cells survived more than 3 months. Attempts to isolate HSV-2 from peripheral blood leukocytes and from tumors by combined cultivation with human embryo skin-muscle (HESM) tissue cell cultures and with 1-96, and also from cerebral and spinal tissue, were unsuccessful. Electron microscopic examination of neural ganglia of sacral and lumbar posterior roots also did not produce positive results. HSV-2 was isolated by cultivation with HESM cells from a pool of neural ganglia from four group A animals on Day 185. This indicates the persistence of HSV-2 in afferent regional neural ganglia. Figures 4; references 26: 4 Russian, 22 Western.

RAPID METHOD FOR DETERMINING ANTIVIRAL ACTIVITY OF INTERFERON INDUCERS WITH AN EXPERIMENTAL INFECTION

Moscow VOPROSY VIRUSOLOGII in Russian No 3, 1979 pp 303-306 manuscript received 17 May 78

NOVOKHATSKIY, A. S., CHERKASHINA, N. P. and YERSHOV, F. I., Institute of Virology imeni D. I. Ivanovskiy, USSR Academy of Medical Sciences, Moscow

[Abstract] A method to be used as a guide in evaluating antiviral activity of interferon-inducing chemical compounds was based on model experiments on mice treated with typical interferon inducers, poly(1):poly (C) and polyacrylic acid, and infected with the Sindbis virus. The inducers were administered twice to groups of 10 mice, 24 h and 1 h before infection. Infected animals were sacrificed after 24 h and 10% brain suspensions were prepared. Parallel samples were titrated on 48-h trypsinized chick embryo fibroblast cultures and infectious activity was determined after 48 h. Data obtained were analyzed by the Fischer-Student test. It is advisable to determine first the LD₅₀ for the test compounds and to use 1/4-1/8 LD₅₀ for the initial tests. Advantages of this method are its brevity (96 h) and the obtainment of statistically weighted results with relatively few animals. The mean standard error for the method was ± 0.333 log plaque forming units/ml of 10% brain suspension. With the use of suitable administration schedules, the method may be used also to evaluate antiviral activity of other chemotherapeutic agents, such as Actinomyces rimosus modified RNase. References 5 (Russian).

USE OF POLYCATIONS TO SUPPRESS ANTICOMPLEMENTARY PROPERTIES OF AGAR IN IMMUNE HEMOLYSIS REACTIONS

Moscow LABORATORNOYE DELO in Russian No 6, 1979 pp 361-363 manuscript received 3 Feb 78

SHARETSKIY, A. N., DUBOVIK, B. V., ETLIS, V. S. and SHOMINA, F. N., Scientific Research Institute of Medical Radiology, USSR Academy of Medical Sciences, Obninsk

[Abstract] An investigation is made of the feasibility of using synthetic polycations to inactivate agar in immune hemolysis reactions. The effectiveness of cationic polymers was studied in two versions of Jerne's

method of determining antibody-forming cells (direct and indirect), and in the reaction of radial immune hemolysis in agar gel. The results of the tests show that various cationic polymers are effective in suppressing anticomplementary properties regardless of the nature of the ionogenic groups and structure of the monomeric link. Consequently, the action of these compounds is attributed to their physicochemical properties resulting from the polyionic nature of the molecules. Polyelectrolytes that carry charges of opposite sign form weakly dissociating complexes when they interact, where the charges are mutually neutralized. Suppression of the anticomplementary action of agar gel is probably due to such a mechanism. It is concluded that the anticomplementary activity of agar is due to its polyanionic structure, which means that no amount of treatment by washing can totally eliminate these anticomplementary properties. References 2: 1 Russian, 1 Western.

USSR

UDC 591.044:595.324:578.083

CHRONIC ACTION OF THE BANVEL-D HERBICIDE ON DAPHNIA MAGNA STRAUS

Moscow BYULLETEN' MOSKOVSKOGO OBSHCHESTVA ISPYTATELEY PRIRODY, OTD. BIO.,
in Russian Vol 84 No 3, May/Jun 79 pp 70-77 manuscript received 12 Feb 78

TROFIMOVA, M. G.

[Abstract] Banvel-D--2methoxy-3,6-dichlorobenzoic acid dimethylamine--is used everywhere in the USSR to combat weeds especially those resistant to 2,4-D and 2M-4X, on grains, on hayfields, etc. Its persistence and metabolism are well known. In the present report the action of the herbicide on the Chadocera crayfish, *Daphnia magna*--which is used as a test agent in water toxicology--was tested. The banvel was of US origin. The test agent had been cultured in the laboratory (Ardulov, 1976). Exposure (12.8-67 mg/l) was maintained over five generations. Survival on exposure to 2.8-11.5 mg/l levels was equal to controls. At a 23 mg/l level, survival rate, in the second generation decreased, at 67 mg/l it began to decrease in the first generation. Size and reproductive capacities also decreased, in the sequential generations, with time of exposure. In reservoirs this would mean a loss of edible material for fish. Figures 3; references 17: 11 Russian, 6 Western.

USSR

UDC 622.411.5:628.511.1

EVALUATION OF EQUIPMENT USED FOR ELIMINATION OF AIR DUST

Tashkent IZVESTIYA AKADEMII NAUK OF UZSSR, SERIYA TEKHNIЧЕСКИХ НАУК
in Russian No 3, 1979 pp 78-79 manuscript received 31 Jul 78

SOKOVNIN, V. I., Council on Study of Productive Forces of the Republic
Uzbek SSR Academy of Sciences

[Abstract] Seven formulas are suggested for evaluation of the effectiveness of dust collectors, ventilation, water-spraying and other equipment in plants of the coal, ferrous and nonferrous industries. These formulas can be used for a proper selection of needed equipment, with consideration of the amount of dust present at a given work station in a plant. Economic factors are also included in computations. References 4 (Russian).

USSR

UDC 576.858.75.095.38:598.422(470.46)

STUDY OF PROPERTIES OF INFLUENZA VIRUSES ISOLATED FROM LARIDAE IN THE
ASTRAKHANSKAYA OBLAST IN 1976

Moscow VOPROSY VIRUSOLOGII in Russian No 3, 1979 pp 227-232 manuscript
received 25 Apr 78

PODCHERNYAYEVA, R. YA., MYASNIKOVA, I. A., BLINOVA, V. K., BELOUSOVA, R.
V., ANDREYEV, V. P., BRAUDE, N. A., SHCHUKINA, N. V. and L'VOV, D. K.,
Institute of Virology imeni D. I. Ivanovskiy, USSR Academy of Medical
Sciences, Moscow

[Abstract] Two types (seven strains) of avian influenza viruses were
isolated in the Volga delta area from the slender-billed gull [*Larus genei*]
the little tern [*Sterna albifrons*] and the common tern [*Sterna Hirundo*].
The strains from the gull had a previously unknown surface antigen com-
bination (Hav4Nav2); those from the terns had the antigen formula Hav5Nav2.
The gull strains (Hav4Nav2) differed from the tern strains (Hav5Nav2) in
the more pronounced hemagglutination, infectious and eluting activity and
lower immunogenicity. There were differences among strains with the same
antigen formula (Hav5Nav2) in reproduction at 40°C, neuraminidase activity,
immunogenicity and sensitivity to chick normal serum inhibitors. Only
two of seven strains exhibited plaque forming capacity and were pathogenic
for mice. The reference strain (A/tern/SA/61) had higher hemagglutination,
infectious and eluting activity and was more pathogenic for chicks and
apathogenic for mice. Figures 2; references 8 (Western).

USSR

UDC 576.858.095.6.083.35

MORPHOLOGICAL DATA ON SOME ASPECTS OF THE MULTIPLICATION OF STRAINS
LEIV-108A and LEIV-3306 Uz OF THE BAKU VIRUS IN CHICK FIBROBLAST CELL
CULTURES

Moscow VOPROSY VIRUSOLOGII in Russian No 3, 1979 pp 283-285 manuscript
received 25 Apr 78

GUSHCHINA, YE. A., TSILINSKIY, YA. YA., GUSHCHIN, B. V., USMANOV, R. K.,
L'VOV, D. K. and KLIMENKO, S. M., Institute of Virology imeni D. I.
Ivanovskiy, USSR Academy of Medical Sciences, Moscow

[Abstract] Multiplication of LEIV-108A (from *Ornithodoros capensis*) and
LEIV-3306 Uz (from *O. coniceps*) strains of the Baku virus was studied by
electron microscopy in primary trypsinized chick fibroblast (CF) cultures.

Viral titer in the culture fluid reached a maximum 24 h after infection and comprised 3.1 and 2.31 log PFU [plaque forming units]/ml for LEIV-108A and LEIV-3306 Uz, respectively; the 24-h maximum indicated a longer latent period and slower replication in comparison with other orbiviruses. The viral titer in cells at the same time was basically similar. Morphological changes typical for orbivirus infection were observed in cells infected with both strains: fine granular matrix with circular "nucleoids" and tabular structures in the cytoplasm. Similar changes were also observed in the nuclei of cells infected with LEIV-108A. The greater cytocidal effect of LEIV-108A is apparently due to its capacity to multiply in the cytoplasm and nucleus. New LEIV-3306 Uz virus is released from cells by budding and has a modified external membrane. The morphological differences in the two strains are a function of strain properties which in turn depend on the tick species isolated from the different geographic areas in the USSR (LEIV-108A from Azerbaidzhan and LEIV-3306 Uz from Uzbek SSR). The use of the term "nucleoids" is suggested for the circular structures rather than "viral particles," since it defines more precisely the morphological structure comprising the central section of the budding and extracellular form of LEIV-3306 Uz. Figures 3; references 13: 6 Russian, 7 Western.

USSR

UDC 616.988.75-039-092.9

PERSISTENT INFECTION IN MOUSE L CELLS INFECTED WITH THE PARAINFLUENZA VIRUS SV5

Moscow VOPROSY VIROLOGII in Russian No 3, 1979 pp 289-293 manuscript received 24 Apr 78

AZADOVA, N. B. and ZHDANOV, V. M., Institute of Virology imeni D. I. Ivanovskiy, USSR Academy of Medical Sciences, Moscow

[Abstract] A noncytotoxic, stationary persistent infection was established after 10-12 passages: lack of fluctuations in the L_{SV5} culture and lower infectious titers; 60% of the cells contained fluorescing virus-specific antigen, primarily in the nuclear membrane area. The persistently-infected cells differed little from normal virus-free cells. The lack of correspondence between virus accumulation and the number of cells with virus-specific particles may be due to the presence of defective interfering particles and the accumulation of virus-specific ribonucleoprotein structures. The persistent culture L_{SV5} was fully resistant to infection by homologous viruses (Sinibis, Sendai and Newcastle disease viruses) and did not lose its capacity for subculturing. Infection of normal L cells with the concentrated persistent and standard SV5 viruses decreased virus accumulation after 72-96 h in comparison with its level in L cells infected only with

the standard SV5. An endogenous oncornavirus may also be implicated in the maintenance of the persistent infection. Figures 3; references 10: 3 Russian, 7 Western.

USSR

UDC 576.851.555.078.14

TESTING THE SUITABILITY OF NUTRIENT MEDIA OF DRY COMPONENTS FOR ACCELERATED DETECTION OF *Cl. PERFRINGENS*

Moscow LABORATORNOYE DELO in Russian No 6, 1979 pp 369-371 manuscript received 3 Apr 78

KURBANOVA, I. Z., ZEMLYANITSKAYA, YE. P., SERGEYEVA, T. I. and ERTUGANOVA, Z. A., Institute of Epidemiology and Microbiology imeni N. F. Gamaleya, USSR Academy of Medical Sciences, Moscow

[Abstract] Tests were done on a number of dense nutrient media prepared from dry protein components produced by Dagestan Scientific Research Institute of Nutrient Media and the Olaynskiy Chemical Plant. The components were principally enzymatic hydrolysates of casein. The proportions of ingredients were selected so that the finished medium would contain 384-836 mg% total nitrogen, 90 mg% amine nitrogen, 1.8-3% peptone and 0.4-0.9% chlorides. During preparation, the protein base was supplemented with 0.1% sodium thioglycolate, 1% dry feed yeast extract, 1.5% agar, and mineral salts, and the pH was adjusted to 7.2-7.4. The media were used in accelerated determination of active growth of *Cl. perfringens* type A after 4 hours of incubation at 37°C. The most pronounced zone of inhibition of growth of *Cl. perfringens* around disks with antibiotics was observed on a medium of tryptic hydrolysate of casein. References 3 (Russian).

USSR

UDC 616.988.75-078

IMPROVING THE EFFICACY OF VIROLOGICAL ANALYSES IN THE CASE OF INFLUENZA

Moscow LABORATORNOYE DELO in Russian No 6, 1979 pp 379-380 manuscript received 6 Sep 77

ANDREYEVA, YE. A., LAZAREVA, T. A. and VASERIN, YU. I., Sverdlovsk Scientific Research Institute of Viral Infections

[Abstract] The report describes a method of ultrasonic treatment of the primary material to improve separability of influenza virus from patients with acute respiratory illnesses. Smears were taken from the lower nasal passages and placed in a test tube with 5 ml of Hanks solution (pH 7.2-7.4). After thorough agitation, the material was centrifuged at 2000 rpm for 15 minutes, and smears were prepared for study by an immunofluorescent method. The fluid over the precipitate was divided into two portions, one of which was ultrasonically treated at 22 kHz for 1 minute. The results of studies showed that ultrasonic treatment considerably increases the separability of the virus. The method is recommended for improving the level of virological diagnosis of influenza, which is particularly important in the interepidemic period. Detection of strains that are circulating in the spring is also important for studying the variability of influenza virus. References 4: 2 Russian, 2 Western.

USSR

UDC 577.47/.48:577.15.07

INFLUENCE OF MEDIUM COMPOSITION ON SYNTHESIS OF EXOPROTEASES BY ASPERGILLUS CANDIDUS STRAIN 70

Moscow BIOLOGICHESKIYE NAUKI in Russian No 6, 1979 pp 73-76 manuscript received 14 Apr 78

BARANOVA, N. A., KRYKHITINA, N. M. and YEGOROV, N. S.

[Abstract] Influence of proteins, protein hydrolysates, glucose, saccharose, maltose, arabinose, xylose, raffinose, lactose and galactose on synthesis of exoproteases by *Aspergillus candidus* (strain 70) was studied. The synthetic medium contained (g/L): NaNO_3 5.0; KH_2PO_4 2.0; MgCl_2 1.0; CaCl_2 0.2; FeSO_4 1 mg % and CoSO_4 1 mg % (medium A); medium B contained the same ingredients and 0.2% of casein. The natural medium in which this fungus was grown contained (%): saccharose 0.5; NaNO_3 0.5; KH_2PO_4 0.2; MgCl_2 0.1 and CaCl_2 0.02 (medium A); medium B was of the same composition, plus 0.2% of casein as a single source of carbon and nitrogen. *Aspergillus candidus* formed exoproteases in both media. Addition of casein, insoluble fibrin or protein hydrolysate to synthetic medium did not accelerate the synthesis of proteases. The proteolytic activity in experiments with washed mycelium (organic medium) was observed in 3 hr after the fungus

incubation. The biosynthesis of proteases is strongly influenced by the source of carbon. Thus, it amounted to 900, 800, 750 and 740 μ of tyrosine/ml of medium (control 535 μ) for saccharose, glucose, xylose and raffinose, respectively. The highest synthesis rate of exoproteases takes place at the end of the logarithmic and stationary development phases of the fungus when a part of the carbon and nitrogen source is already consumed from the medium and some shortage in these substances is felt by the fungus. Addition of $2 \cdot 10^{-4}$ M of guanosinemonophosphate to the culture medium stimulates to some extent the synthesis of proteolytic enzymes of *Aspergillus candidus*. Figures 1; references 9: 2 Russian, 7 Western.

USSR

UDC 616.2-022.6:576.858.74]-078

ROLE OF *M. HOMINIS* IN PATHOLOGY OF THE RESPIRATORY TRACT

Moscow LABORATORNOYE DELO in Russian No 6, 1979 pp 363-366 manuscript received 3 Oct 77

ASRATYAN, A. A., YEFREMOVA, I. I. and VASIL'YEVA, V. I., Institute of Epidemiology and Microbiology imeni N. F. Gamaleya, USSR Academy of Medical Sciences, Moscow

[Abstract] Examinations were done on 786 adult patients to determine the specific weight of *M. hominis* in the etiology of respiratory illnesses. Among these patients, the diagnosis was acute respiratory illness for 533, and acute pneumonia for the remaining 253. The results of the study show that this representative of the Mycoplasmataceae plays a definite and rather appreciable part in formation of acute respiratory illness and pneumonia. Simultaneous examination of patients for diagnostic increases in the antibodies for *M. hominis*, *M. pneumoniae* and a number of viral agents showed that *M. hominis* infection is encountered fairly frequently both by itself and in combination with other infectious agents. References 7: 1 Russian, 6 Western.

USSR

UDC 615.478.6:614.894.4+615.916.126.23.036.11

PORTABLE APPARATUS FOR THE DEMONSTRATION OF THE PROTECTIVE PROPERTIES
OF THE FILTER AND CARTRIDGE TYPE GAS MASK

Moscow VOYENNO-MEDITSINSKIY ZHURNAL in Russian No 6, Jun 79 p 67

LEBEDEV, M. D., candidate of medical sciences, Lt. colonel, medical service

[Abstract] An apparatus was built to demonstrate the protective action of individual filter elements and of the cartridge of a gas mask. It could also be used to demonstrate acute CO poisoning. The principle of operation was illustrated by use of cigarette smoke. The smoke was passed through activated charcoal to remove most of the combustion products; then it was passed through an antismoke filter and a layer of soda lime, to remove CO₂, into a chamber containing a live mouse. In a short time the CO still present in the air stream killed the animal. Redirection of the air stream through a gas mask cartridge removed the CO, so that an animal in another chamber, exposed to the CO-free air stream, remained alive. Figure 1.

USSR

UDC 616-001.11/.12-057:626.02

CLINICAL SYMPTOMS OF LUNG BAROTRAUMA

Moscow VOYENNO-MEDITSINSKIY ZHURNAL in Russian No 6, Jun 79 pp 51-52

NAZARKIN, V. YA., docent, colonel, medical service

[Abstract] Lung barotrauma is one of the complications of using breathing apparatus (aqualung) under conditions of normal or high pressure. There are four basic types of this disorder: barotraumatic emphysema (interstitial, subcutaneous and mediastinal as well as emphysema complicated by gas embolism), barotraumatic pneumothorax, barotraumatic gas embolism and a mixed form of lung barotrauma. Clinical symptoms and causes of trauma are described. Treatment was not discussed.

USSR

UDC 576.858.75.095.57

GENOME STRUCTURE OF RECOMBINANT STRAINS OF INFLUENZA A VIRUSES WITH
DIFFERENT ANTIGENIC AND BIOLOGICAL PROPERTIES

Moscow VOPROSY VIRUSOLOGII in Russian No 3, 1979 pp 210-216 manuscript
received 6 Feb 78

ZAZIMKO, L. A., All-Union Scientific Research Institute of Influenza,
USSR Ministry of Health, Leningrad

[Abstract] The viruses used were A/WSN/33, A/Singapore/57 and variants X-7 and X-9 obtained by recombination of A/WSN/33 and the "Singapore-like" influenza virus A/RI⁺/57. Analysis of the degree of biochemical relatedness of genomes of recombinant and parent strains of molecular hybridization on an SSC X 2 buffer demonstrated that recombinants X-7 and X-9 contain hereditary material from both strains used for the recombination. This explains the greater number (in comparison with A/WSN/33 and A/Singapore/57) of bases in the RNA composition of X-7 and X-9 that is similar in sequence to the RNA from each parent. The biochemical identity of individual RNA fragments showed that the genome of X-9 contained RNA fragments III, IV and VII from A/Singapore/57 and fragments V and VIII from A/WSN/33. The genome of the recombinant strain X-7 with the antigen structure HON2 had the RNA fragments V and VII similar in sequence to the RNA bases of A/Singapore/57 and fragments III, IV and VIII of A/WSN/33. The synthesis of RNA-RNA hybrids with fragments I, II and VI with electrophoretic mobility typical for a homologous system suggested that these RNA fragments from parents A/WSN/33 and A/Singapore/57 were identical in sequence or had very minor differences. Analysis of X-7 and X-9 genome structure, electrophoretic mobility and the antigen profile of surface proteins suggests that RNA fragment IV of the influenza virus strains is responsible for hemagglutinin synthesis and fragment V for neuraminidase synthesis. Rimantadine resistance typical for A/WSN/33 which is transferred during recombination to X-7 and X-9 is attributed to RNA fragment VIII. Figures 2; references 20: 2 Russian, 18 Western.

SUBTILISIN 72 - A SERINE PROTEASE FROM BAC. SUBTILIS STRAIN 72 SIMILAR TO SUBTILISIN CARLSBERG

Moscow BIOKHIMIYA in Russian Vol 44 No 5, May 79 pp 886-891

AKRAPOV, V. KH., BELYANOVA, L. P., BARATOVA, L. A. and STEPANOV, V. M., All-Union Scientific Research Institute of Genetics and Selection of Industrial Microorganisms, Moscow

[Abstract] Using covalent affinity chromatography on sepharose containing p(ω -aminomethyl)phenylboric acid as a ligand, a serine protease, Subtilisin 72, was isolated from the culture medium of Bac. Subtilis, strain 72. The homogeneity of this enzyme was shown by means of isoelectrofocusing on thin layer polyacrylamide gel. Subtilisin 72 differs from other subtilisins by its isoelectric point, by its amino acid composition and its N-terminal sequence. It resembles somewhat the Carlsberg subtilisin by an identical N-terminal amino acid sequence down to the 35th step, except for changes at the 21st step (Phe \rightarrow Tyr) and the 30th step (Val \rightarrow Ile). Evidently, the structural genes of these subtilisins separated only recently in the evolutionary process. Figures 3; references 20: 4 Russian, 16 Western.

DETERMINATION OF THE PRIMARY STRUCTURE OF AN ANOMALOUS E-LIKE HEMOGLOBIN

Moscow BIOKHIMIYA in Russian Vol 44 No 5, May 79 pp 816-821 manuscript received 4 Aug 78

SPIVAK, V. A., MULCHANOVA, T. P., YERMAKOV, N. V., TOKAREV, YU. N. and GAR'KAVTSEVA, Central Scientific Research Institute of Hematology and Blood Transfusion, USSR Ministry of Health, Moscow, and the Institute of Medical Genetics, USSR Academy of Medical Sciences, Moscow

[Abstract] This is a report on the first molecular diagnosis of E-like hemoglobin in the USSR. The primary structure of two anomalous E-like hemoglobins detected in a hematological patient and her relative was described. The patient had been diagnosed with anemia in a routine examination. Clinical observation, elevated levels of fetal hemoglobin and the presence of E-like hemoglobin suggested β -Thalassemia with anomalous hemoglobin (two sisters and the mother of this patient were also the carriers). The anomalous hemoglobin HbX was identified by ion exchange

chromatography on CM-cellulose. Peptide mapping of the β -chain trypsin hydrosylates showed an amino acid substitution on β T3. The amino acid analysis showed that the anomalous peptide is the 18th to 26th amino acid fragment with glutamic acid replaced by lysine. The patient and one of her sisters were found to be the carriers of hemoglobin E ($\alpha 2 \beta 2^{26} \text{Gly} \rightarrow \text{Lys}$). Figures 4; references 15: 4 Russian, 11 Western.

UDC 576.312.36

MECHANISMS OF CYTOGENETIC ACTIVITY OF CHROMIUM AS AN ENVIRONMENTAL POLLUTANT

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 245 No 5, Apr 79 pp 1234-1236 manuscript received 31 Oct 77

BIGALIYEV, A. B., SHPAK, N. K. and SMAGULOV, A. S., Aktyubinsk State Medical Institute

[Abstract] Using the autoradiography method, the duration of the mitotic cycle and of individual cell cycle phases has been studied on blood cell cultures from individuals exposed to chromium compounds. Analysis of the data showed that in the lymphocyte culture, the periods of the mitotic cell cycles of the control group were: G_1 - 4.9 hrs, S - 9.5 hrs, G_2 - 3.2 hrs and T - 18.3 hrs; in the cultures obtained from individuals exposed to chromium, the values were: G_1 - 5.1 hrs, S - 15.2 hrs, G_2 - 5.1 hrs and T - 25.6 hrs. The mechanism of action of the chromium compounds on the level of subcellular structures and submolecular processes is manifested by the depression of the reproductive properties of the cells, expressed by the blocking of individual cell cycle phases. The biological effect of chromium compounds relates principally to the reduction of Cr^{VI} on plasmatic membranes or inside the cells and to the complex Cr^{III} forming cellular ligands, including DNA. Evidently, formation of a complex between three-valent chromium and DNA results in a disturbance of the replication, transcription and translation processes, which in turn may lead to chromosomal aberrations and gene mutations. Figure 1; references 13: 4 Russian, 9 Western.

NEW VECTOR PLASMIDS FOR SELECTION OF RECOMBINANT CLONES OF E. COLI

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 245 No 5, Apr 79 pp 1250-1253 manuscript received 3 Jan 79

KOPYLOVA-SVIRIDOVA, T. N., FODOR, I. and BAYEV, A. A., academician, Institute of Biochemistry and Physiology of Microorganisms, USSR Academy of Sciences, Pushchino, Moskovskaya Oblast'

[Abstract] An attempt was made to construct new vector plasmids in vitro, carrying two genetic markers: resistance to ampicillin and to tetracycline. The starting plasmids were pMB9 and RSF2124. The DNA of these plasmids were restricted under conditions of EcoRI (25 mM tris pH 8.5, 2 mM MgCl₂). The clones were collected on agar. Each plasmid was isolated from individual clones and characterized. Three were selected because they satisfied the requirement of resistance to the two antibiotics. It was shown that cloning Hind III-, Pst I-, EcoRI fragments inactivates resistance to tetracycline, while cloning Pst I fragments inactivates resistance to ampicillin. Inactivation of genetic markers assures the selection of corresponding recombinant clones. Having lost the ability to synthesize colicine, the three plasmids retained their immunity towards it. Their resistance to ampicillin and tetracycline was considerable. Figures 4; references 11: 3 Russian, 8 Western.

HEREDITY OF THE W,w ALLELES IN MAN, AND THE PROBLEM OF GENETIC LOAD

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 246 No 3, May 79 pp 730-732

DUBININ, N. P., academician, SUSKOV, I. I. and BOTVIN'YEV, O. K., Institute of General Genetics, USSR Academy of Sciences, Moscow

[Abstract] Two alleles, determinants of the dimorphism of ear cerumen, are known in human genetics: the dominant allele W responsible for the characteristics of wet cerumen and a recessive allele w - responsible for the characteristics of dry cerumen. Both alleles appear early in life and are preserved throughout the life span. The distribution of W and w alleles among the children of Moscow residents was studied; both healthy and sick children (viral respiratory problems and pneumonia) were examined. The results showed that the relationship between W and w alleles was the same in healthy children as it was in viral respiratory cases. The frequency

of dry cerumen phenotypes was higher in healthy subjects than in children with pneumonia. In general, healthy children showed values approximating the average of Euro-mongolian populations. Allele *w* appears to lower the resistance of the body to pneumonia. In fact, the population risk of contracting pneumonia among the individuals homozygous to *w* (*ww*) is twice as high as that of the controls. References 5: 2 Russian, 3 Western.

USSR

λ -RECOMBINANTS CARRYING GENES *hds* AND *hdm* OF THE EcoK MODIFICATION-RESTRICTION SYSTEM

Moscow DOKLADY AKADEMII NAUK SSSR in Russian No 246(4), 1979 pp 982-985
manuscript received 13 Mar 79

ZINKEVICH, V. YE., TANYASHIN, V. I. and BAYEV, A. A., academician, Institute of Microbial Biochemistry and Physiology, USSR Academy of Sciences, Pushchino, Moscow Oblast

[Abstract] Studies are presented on characterization of a λ -*E. coli* recombinant (λ -642), carrying genes *hds_k* and *hdm_k* responsible for subunits of EcoK DNA-methylase. *E. coli* ED 8659 *r_k⁺* served as DNA donor in production of the recombinant phage λ -642. Studies on proteins synthesized by λ -642 grown on *E. coli* 159 gal, *uvr*, *su*, led to the identification of 6 fractions ranging from 28,000 to 130,000 daltons. A 63,000 and a 28,000 dalton fraction corresponded to subunits of EcoK DNA-methylase, while the 130,000 dalton protein corresponded to the alpha subunit of the EcoK endonuclease in terms of molecular weight. In addition, the *E. coli* ED 8659 DNA fragment cloned in λ -642 EcoR-1 product, which consisted of ca. 11,500 nucleotide pairs, contained 2 restriction sites each for endonucleases Hind III, Bam HI, and Sal I. Figures 3; references 14: 3 Russian, 11 Western.

USSR

UDC 618.19-006.6-08:615.357]:612.017

STATE OF IMMUNE REACTION IN BREAST CANCER PATIENTS TREATED WITH
PREDNISOLONE

Leningrad VOPROSY ONKOLOGII in Russian Vol 25 No 5, 1979 pp 60-62

TSYRLINA, YE. V., FEDOROV, S. N., POROSHINA, T. YE., BUSLAYEVA, V. P.
and SELEZNEV, I. K., endocrinology laboratory and first surgical division
of the "Order of the Red Banner of Labor" Scientific Research Institute
of Oncology imeni Professor N. N. Petrov, USSR Ministry of Health

[Abstract] An analysis is made of a number of indices of cellular immunity among 43 breast cancer patients who had received prolonged treatment with prednisolone. Recent studies have shown that different populations of lymphocytes are not identically sensitive to the action of glucocorticoids, and that the effect also differs with single and repeated application of the drugs. It was found that prolonged treatment with small doses of prednisolone does not cause additional suppression of the activity of cellular immunity in the T- and B-systems against a background of preceding mastectomy and subsequent chemotherapy. In breast cancer patients not treated with hormones, negative reaction to 1-chloro-2,4-dinitrobenzene showed a correlation with high level of glucocorticoids and a low level of androgens. The five-year survival rate among breast cancer patients given prolonged treatment with prednisolone was 20% higher than the average for breast cancer patients after ovariectomy according to data of the Scientific Research Institute of Oncology. References 11: 3 Russian, 8 Western.

USSR

UDC 612.017 - 006:616.831.4

HYPOTHALAMUS AND ACTION OF NONSPECIFIC POLYSACCHARIDE STIMULATORS

Kiev FIZIOLOGICHESKIY ZHURNAL in Russian Vol 25 No 1, Jan/Feb 79 pp 83-87
manuscript received 13 Mar 78

BALITSKIY, K. P., VEKSLER, I. G., VINNITSKIY, V. B. and RYABUKHA, V. N.,
Section of Protective-Regulatory Mechanisms During Carcinogenesis,
Institute of Oncology Problems, Ukrainian SSR Academy of Sciences

[Abstract] Effect of zymosan on cellular immunity reactions and the nature of cancer growth under conditions of elevated functional state of the hypothalamus posteromedial section were studied. Experiments were carried out on rabbits, with electrodes imbedded in the posteromedial hypothalamus section for electrical stimulation. Each rabbit received intramuscularly

5 mg zymosan/kg three times in the course of experiments, with intervals of 4-5 days between injections. The therapeutic effect of zymosan was considerably higher when the hypothalamus in animals, inoculated with Brown-Pearce tumor, was subjected to electrical stimulation. The zymosan prevented cellular immunity lowering in rabbits during the tumor growth. A less intensive tumor growth and accelerated disappearance of tumor transplants are attributed to a much higher cellular immunity because of zymosan combined with the electrical stimulation of the hypothalamus. The average diameter of tumors in control animals was 3.1 ± 0.21 cm in comparison with only 2.4 ± 0.13 cm in experimental animals. After 44 days, the average diam. of tumors in controls dropped to 2.2 ± 0.66 cm (a complete disappearance of tumor in only one case), while it amounted to 0.4 ± 0.19 cm in exptl. animals during the same period, with a complete disappearance of tumors in seven cases. A complete disappearance of tumors, in rabbits injected with zymosan, that took place in 37 days is attributed to a spontaneous macrophageal transformation of lymphocytes because of zymosan and electrical stimulation of the hypothalamus. The protective effect of zymosan and other similar polysaccharides against tumor cells is enhanced by a simultaneous electrical stimulation of the hypothalamus. Figures 3; references 21: 16 Russian, 5 Western.

USSR

UDC 616.12-008.331

MECHANISM OF EXTRASYSTOLIC EXCITATION OF RABBIT CONTRACTILE MYOCARDIUM
BASED ON SEPARATE ACTIVATION OF Na and Ca CHANNELS OF INCOMING CURRENTS

Moscow DOKLADY AKADEMII NAUK SSSR in Russian 246 (4) 1979 pp 1002-1005
manuscript received 29 Feb 78

KUKUSHKIN, N. I. and GAYNULLIN, R. Z., Institute of Biological Physics,
USSR Academy of Sciences, Pushchino, Moscow Oblast

[Abstract] Papillary muscles of the right ventricle of New Zealand breed rabbits were used to study the mechanism of generation of 2-component responses in rabbit myocardium. Experimental procedures were described in a previous study [R. Z. Gaynullin and N. I. Kukushkin, Biophysics, No 3, 505 (1977)]. The studies showed that engagement of prolonged (up to 4 seconds) depolarization current in the surface membrane of papillary muscle of rabbit heart produces a 2-component response which, spreading and reaching parts of tissues outside the zone of electronic inflow of the current, is transformed into 2 separate action potentials, each accompanied by wave contraction. The second of these waves (extrasystolic) is not caused by special stimulation. These findings permit description, for the first time, of the mechanism of rise of extrasystole pulses following closely upon the normal pulse. Such a pair of beats may lead to dangerous tachycardia or fibrillation. It was assumed that such a mechanism of rise of early extrasystoles may occur also in man due to analogous features of 2-component responses found in myocardial fibers of man. Figures 3; references 5: 2 Russian, 3 Western (one by Kukushkin and Gaynullin).

USSR

UDC 612.144

FUNCTIONAL CHANGES IN THE CARDIOVASCULAR SYSTEM OF MACHINESHOP WORKERS
DURING PHYSICAL STRESSFUL WORK

Kiev FIZIOLOGICHESKIY ZHURNAL in Russian Vol 25 No 1, Jan/Feb 79 pp 53-61
manuscript received 23 Dec 77

IVANYURA, I. A., ZHILINA, G. YE., OLELYNIK, B. F. and SUDAKOV, A. I.,
Department of Human and Animal Anatomy and Physiology, Melitopol' Pedagogical Institute

[Abstract] Effect of physical loads on physiological state and adaptation of the cardiovascular system of workers dealing with machining of metals were studied. Eighty healthy workers, 20 to 35 years of age, were studied

during a working day on Monday, Wednesday and Friday. Functional changes in the cardiovascular system were observed during the entire working day and during weekdays when workers were subjected to stressful physical labor. Among these changes were: unstable arterial blood pressure and changes in the systolic and minute volume of blood. The ECG showed signs of a sinusoidal bradycardia and bradyarrhythmia, shortening of systolic indicator, increase in the length of the electric systole, slowing down of the atrioventricular and intraventricular conductivity. Increase in the length of the P, S and T waves and the decrease in the amplitude of the P, R, S and T waves appears after the third and sometimes even after the first hour of work. This is especially true for last days of the workweek. The functional state of all workers undergoes changes during different workdays. Less changes were observed on Mondays in comparison with other workdays, indicating a shift in the compensatory mechanism of the cardiovascular system. Results of this study led to recommendations for better working and rest conditions for workers. Figures 2; references 14 (Russian).

UDC 615.851.111.03:658.431

APPLICATION OF AUTOGENOUS TRAINING IN PSYCHOPHYSIOLOGICAL PREPARATION
OF STUDENT PILOTS TO FLIGHTS

Moscow VOYENNO-MEDITSINSKIY ZHURNAL in Russian No 6, Jun 79 pp 48-49

LOZINSKIY, V. S., candidate of medical sciences, major, medical service

[Abstract] Auto- and heterosuggestive training of first and third year student pilots led to increased emotional stability and improved technical skills. The training used was the I and II exercise of Shults (Lobzin, 1975) and the techniques of Lozanov (1963) and Perekrestov (1968) as modified by Filatov (1975). Students participating in this training were among the best pilots; they retained better the material studied, they performed under complex situations and developed proper flying habits much faster. Continuation of such exercises should increase the psychophysiological readiness of the pilots.

UDC 616.12-008.1-092:616.45-001.1/.3-02:613.863

PATHOGENESIS OF CARDIAC ACTIVITY DISORDERS UNDER CONDITIONS OF EMOTIONAL
STRESS

Moscow PATOLOGICHESKAYA FIZIOLOGIYA I EKSPERIMENTAL'NAYA TERAPIYA
in Russian No 3, May/Jun 79 pp 16-22 manuscript received

SUDAKOV, K. V., Scientific Research Institute of Normal Physiology imeni
P. K. Anokhin, USSR Academy of Medical Sciences, Moscow

[Abstract] Emotional stress results in marked disorders of cardiac activity, and yet the pathogenicity of this stress has not been studied sufficiently enough. Such a study has been undertaken on rabbits. It was shown that both during the acute and chronic emotional stress, cardiac activity was disturbed by changes in the blood level of catecholamines and activation of sympathetic-adrenal mechanisms. Emotional stress occurring during a conflict situation spreads to vegetative and somatic organs through the vegetative nervous system and hypophyseal-adrenal apparatus. Under such conditions, the heart muscle is affected by intensified sympathetic impulses and by adrenal hormones. The effect of adrenal hormones on the heart muscle is mediated by primary sympathetic influences resulting from the stimulation of the neurons of the mesencephalon reticular formation. The development of cardiovascular disorders induced by electric stimulation of the ventromedial hypothalamus can be prevented by a block

of the adrenergic substrate of the reticular formation. The effect of hormones on the heart muscle is determined by their action on the neurons of the reticular formation of mesencephalon, which in turn leads to secondary activation of descending sympathetic effects, making the direct effect of these hormones on the heart muscle somewhat milder. Figures 2; references 16: 11 Russian, 5 Western.

UDC 613.6:613.865:377:355.343.14

PSYCHOHYGIENIC BREAK DURING INSTRUCTION OF RADIO-TELEGRAPH OPERATORS

Moscow VOYENNO-MEDITSINSKIY ZHURNAL in Russian No 6, Jun 79 pp 46-47

SELEDIN, N. A., senior lieutenant, medical services, MINZAR, A. I.,
VERENICH, S. V. and SHUGININ, M. I.

[Abstract] Training of radio-telegraph operators involves certain psychological stresses. To counteract fatigue, a psychohygienic break has been developed during which the operators relax both mentally and physically. Exercises, accompanied by background music, are controlled through a PA system. Upon introduction of this system, work performance has invariably improved. Substitution of a simple break-in-place for the psychohygienic break showed no benefit on the performance of the operators. References 6 (Russian).

USSR

UDC 581.4

GROWTH CORRELATIONS DURING PATHOLOGICAL GROWTH OF CORN SPROUTS INDUCED BY *USTILAGO MAYDIS* (DC.) CDA

Moscow BYULLETEN' MOSKOVSKOGO OBSHCHESTVA ISPYTATELEY PRIRODY, OTD. BIOL., in Russian Vol 84 No 3, May/Jun 79 pp 28-39 manuscript received 15 Jun 76 [sic]

MIKHAEVSKAYA, O. B.

[Abstract] *Ustilago maydis* (DC.) Cda is the causative agent of pustular smut in corn. Mycelia of this parasite, which grows in the corn tissue, induce intensified growth favorable for its development. The present research studied this growth which is pathological, unregulated with respect to the whole plant, resulting in localized plant growth abnormalities. In plants there are some growth correlations caused by formation of definite vital plant forms; the physiological mechanisms of this growth are described as inadequately understood. A chaotic histological structure in the organs, described for neoplasms of the kataplastic gall type, was formed by the growth, and is depicted by illustrations. Apparently, not all of the organs of the sprouts are capable of the pathological growth. Figures 7; references 30: 24 Russian, 6 Western.

USSR

UDC 633.51:632.4 ± 582.288

INFECTION OF SOME VEGETABLE AND MELON CULTURES WITH *THIELAVIOPSIS BASICOLA* (BERK. ET BR.) FERR.

Ashkhabad IZVESTIYA AKADEMII NAUK TURKMENSKOY SSR, SERIYA BIOLOGICHESKIKH NAUK in Russian No 3, 1979 pp 63-64 manuscript received 20 May 78

GLAZOVSKIY, V. A., Botanical Institute Turkmen SSR Academy of Sciences

[Abstract] The pathogenesis of black root rot was investigated, studying the process of infection, spread and localization of the pathogen in the tissue, using vegetables grown in Turkmenistan: carrots, tomatoes, melon, parsley and dill. Histological analysis of these host-plants have been reported with the following generalizations. Penetration of the fungus hyphae is achieved through the cover tissue of the roots, side rootlets and root fibrils. The spread through the tissue is intracellular. When the roots are infected, an intensive tissue maceration of various morphological types is observed. The principle cause of the destruction of host-plants is the maceration of phloem; most of the plants die in an

early stage of growth. Penetration of the pathogen into the cover tissue stimulates the hypersensitivity reaction, expressed by suberization of cellular membranes and formation of rubber and gel-like products in the cells. In many cases this leads to growth arrest and hypha lysis in the host-plant. Figure 1; references 11: 10 Russian, 1 Western.

USSR

UDC 632.9.3.2.4

BIOLOGICAL FEATURES IN THE GUR'YEV SUBURBS OF APHYTIS PROCLIA WALKER
WHICH PARASITIZES SAN JOSE SCALE

Alma-Ata IZVESTIYA AKADEMII NAUK KAZAKHSKOY SSR, SERIYA BIOLOGICHESKAYA
in Russian No 3, May/Jun 79 pp 33-40

MATESOVA, G. YA., Institute of Zoology, KazSSR Academy of Sciences,
Alma-Ata

[Abstract] Interrelations between the San Jose scale (*Quadraspidiotus perniciosus*) and *Aphytis proclia* were studied in orchards of Gur'yev suburbs (on the Ural River, south-west part of the Kazakh SSR). It was established that *Aphytis proclia* in this part of Kazakhstan manages to produce five generation in one year while parasitizing on three generations of the San Jose scale. A massive appearance of mature *Aphytis proclia* falls on the first week in May, first ten days in June, July and August, last five days in August, first five days in September and during the last ten days in September. Larvas of *Aphytis proclia* are found usually under the wings of the San Jose scale. The winter-spring period kills twice as many of San Jose scale as those of the *Aphytis proclia*. The microecological habitat conditions, temperature and humidity influence the number of generations per year of the *Aphytis proclia*. The percentage of the San Jose scale never drops to any significant level, although the percentage of the parasitizing *Aphytis proclia* on it could reach, on the average, 27-43.4%, depending on location. Figures 6; references 5 (Russian).

USSR

UDC 577.391:547.963

AGE CHARACTERISTICS OF THE RADIATION REACTIONS OF HEPATOCYTES

Yerevan BIOLOGICHESKIY ZHURNAL ARMENII in Russian No 2, 1979 pp 150-156
manuscript received 9 Jan 78

KARAGEZIAN, E. G. and OGANDZHANYAN, E. YE., Sector of Radiobiology, ArmSSR
Ministry of Health

[Abstract] Sensitivity to radiation at early age and the relationship of the liver to this have not been thoroughly studied. The subject of the present study was cytological changes in the livers of mice of different ages with a low (100 rads) dosage of radiation administered one time. The mice were taken in three groups by age: one month, three months, and one year. Sections of liver were examined at various intervals after exposure, from 30 minutes to six days. In the one-month mice it was found that the nuclei of hepatocytes from the liver became enlarged on the second day after exposure. The number of binucleate hepatocytes began decreasing on the same day, dropping to 50% of control by the sixth day. This indicates impairment of physiological regeneration of the organ, while the larger nuclei and the increase in the number of hepatocytes with five or more nucleoli appeared to be a compensatory reaction. These changes were not observed in three-month mice, but in the one-year group reliable variation again occurred. In the latter group all three indexes (size of nuclei, number of binucleate cells, and numbers of nucleoli) increased, indicating a general rise in physiological regeneration in response to exposure. Thus, it is clear that one-month and one-year mice are significantly more sensitive to radiation than sexually mature, three-month-old mice.

UDC 576.11

RADIATION-CHEMICAL AND PHOTOCHEMICAL ABIOTIC SYNTHESIS OF URIDINE-PHOSPHATES IN A DRY STATE

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 254 No 5, May/Jun 79
pp 1253-1257 manuscript received 20 Nov 78

KUZICHEVA, YE. A. and ISUPKINA, N. V., Cytology Institute, USSR Academy of Sciences, Leningrad

[Abstract] The effect of γ -radiation and UV light on the phosphorylation of uridine in dry state was studied. A solution containing equimolar quantities (0.04 M) urea, ammonium chloride, Na_2HPO_4 and uridine was

irradiated with γ -rays (^{137}Cs) or UV light (Lamp DB-30) to yield the same product: uridine monophosphate, which showed properties similar to uridine-5-monophosphate and uridine-2',3'-cyclophosphate. The only difference noted between the synthetic and natural nucleotides were in UV absorption at an alkaline pH and in the R_f ; most probably this was due to differences in the isomerism of these products. Figures 2; references 14: 4 Russian, 10 Western.

USSR

UDC 63:06;.12(091.5)

FIFTIETH ANNIVERSARY OF THE ALL-UNION ACADEMY OF AGRICULTURAL SCIENCES
IMENI V. I. LENIN

Moscow SEL'SKOKHOZYAYSTVENNAYA BIOLOGIYA in Russian No 3, 1979 pp 259-267

SHATILOV, I. S., All-Union Academy of Agricultural Sciences imeni V. I. Lenin, Moscow

[Abstract] A historical summary is presented of the development of scientific agricultural methods during the Soviet period beginning in 1918, and leading up to the formation of the All-Union Academy in 1929. The establishment of institutes of the Academy, dealing with specific agricultural problems throughout the territory of the Soviet Union, is described, with highlights in the work of such Soviet scientists as V. S. Pustovoyt in plant selection and N. M. Tulaykov in grains for arid regions. Soviet work in fertilizers, irrigation, pest and disease forecasts, and other aspects of modern agriculture are cited. Animal husbandry and the development of hybrids for Soviet conditions, veterinary science, and agricultural economics are also discussed.

USSR

UDC 636.082.23

MODERN PROBLEMS OF ANIMAL BREEDING FOR RESISTANCE TO DISEASES

Moscow SEL'SKOKHOZYAYSTVENNAYA BIOLOGIYA in Russian No 3, 1979 pp 345-348
manuscript received 12 Dec 78

ERNST, L. K., DMITRIYEV, N. G. and ZHIGACHEV, A. I., Leningrad Veterinary Institute

[Abstract] Losses of meat, milk, wool and eggs, along with low fertility and early culling on Soviet farms, have led to genetic research to combat such problems. Examples of genetic disease resistance include Algerian sheep that are resistant to malignant anthrax and Egyptian and US varieties of chickens that withstand leucosis. Research with cattle, sheep, swine and fowl is cited. The appearance of recessive gene traits in numerous offspring through artificial insemination is discussed, and the goals of high productivity along with disease resistance are stressed. References 25: 2 Russian, 23 Western.

USSR

UDC 636.082.26.001.4

ACCOMPLISHMENTS AND FUTURE TASKS OF ZOOTECHNICAL SCIENCE IN THE SPHERE OF ANIMAL HYBRIDIZATION

Moscow SEL'SKOKHOZYAYSTVENNAYA BIOLOGIYA in Russian No 3, 1979 pp 349-355 manuscript received 9 Oct 78

VSLAKIKH, A. S. and MAKUSHENKO, N. A., All-Union Academy of Agricultural Sciences imeni Lenin and Ukrainian Scientific Research Institute for Animal Husbandry in the Steppe Regions imeni M. F. Ivanov, Askaniya-Nova, Kherson Oblast

[Abstract] In efforts to increase the hardiness of cattle while enhancing meat production, crosses of red steppe cattle, Ukrainian grey cattle, and other domesticated breeds with European bison, bantengs and zebus were undertaken. Significant weight-gaining advantages have been recorded. Similarly, crosses of Merino and Arkharo wild sheep have produced hybrids with the fine wool of the former and the hardiness of the wild variety. Another direction of selection research has sought to eliminate or minimize hybrid sterility. Studies elsewhere which attempt to develop cattle, sheep and other livestock that are suited to local conditions are also summarized, with special emphasis on crosses of yaks and zebus with domestic breeds. Figures 5; references 30: 26 Russian, 4 Western.

VIRUSOLOGICAL AND IMMUNOLOGICAL ASPECTS OF LEUCOSES IN CATTLE (REVIEW ARTICLE)

Moscow SEL'SKOKHOZYAYSTVENNAYA BIOLOGIYA in Russian No 3, 1979 pp 361-366
manuscript received 3 Jul 78

BURBA, L. G., All-Union Institute of Experimental Veterinary Science,
Moscow

[Abstract] Morphological, biochemical, and immunogenic aspects of the virus known as oncornavirus or bovine leucositic virus are discussed showing the connection to enzootic leucosis. The cultivation of the virus for study, serological methods of diagnosis, and uncovering the epizootological situation for leucoses in herds of cattle by using serological reactions are discussed. The need for discovery and isolation of infected animals is stressed. Similar hematological and serological research in Belgium, France, Holland and Sweden is cited. Genetic and other factors are regarded as topics for further research on the virus-induced ailment. References 42: 7 Russian, 35 Western.

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